Raymond Deneen

The PROFESSOR *And* THE SAW

THE PROFESSOR AND THE SAW

A LITTLE STORY FOR THOSE
WHO LIKE TO USE TOOLS



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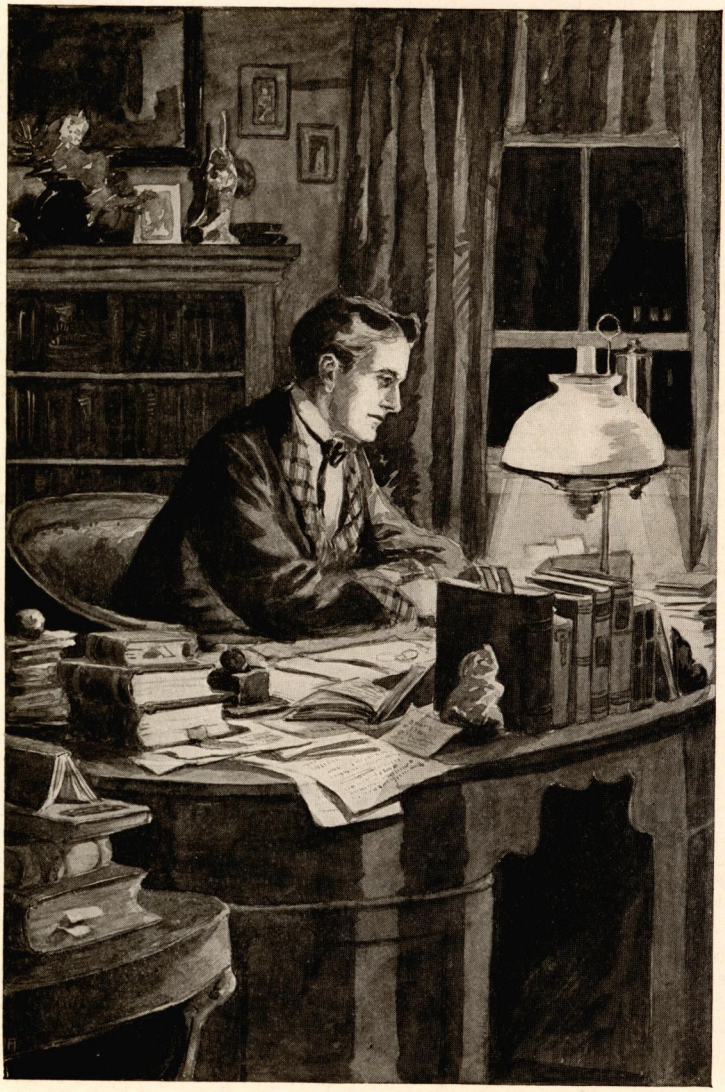
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FOREWORD

The Simonds Manufacturing Company presents this booklet in the hope that it will be interesting and valuable in several ways. In the first place, the story of the college professor who turns to carpentry as the means of regaining his health is based upon fact, and should prove interesting. Second, the booklet contains what the consensus of expert opinion has decided are the essential and proper tools for an ideal manual training carpentry kit or complete home outfit for carpentry work. Third, the story aims to show the benefits of a manual training course in carpentry in the public schools and to interest its readers in securing the introduction of such a course in their town schools, while supplying them with arguments to use against those doubtful of the utility of manual training. Fourth, the story aims to interest boys in the use of tools, not only as a means of physical development and healthful exercise, but to enable them to make themselves useful about home or camp, develop their creative and constructive faculties, train them in accuracy and observation, and teach them to make hands and brain work together. And finally, the supplement dealing with the construction of various useful things should be of value to the amateur carpenter, while it is also hoped that this little story may lead him to become better acquainted with the Simonds saws.

Fitchburg, Mass., the Home of the Simonds Manufacturing Company, is a city of varied industries, including one of the largest saw factories in the world. The Simonds Manufacturing Company has five manufacturing plants and ten branch houses in the United States and Canada. The president of this company was responsible for the Fitchburg Plan of Co-operative Industrial Education whereby boys spend one week in high school and one in the shop. Near the factory is the Massachusetts State Normal School, where interesting work is being done in preparing teachers of the practical arts. From Fitchburg went Professor Calvin Milton Woodward, who began the manual training movement in St. Louis in 1880.

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Professor Wentworth lifted his drawn and tired gaze from the papers covering his desk

THE PROFESSOR AND THE SAW

I

INTRODUCING AN OVERWORKED PROFESSOR, A SAW, AND A DISPLAY OF COLLEGE SPIRIT, AND TELLING HOW DISASTER OVERTOOK THE PROFESSOR



ROFESSOR REED WENTWORTH lifted his drawn and tired gaze from the pile of papers covering his desk. It was not yet daybreak of a gray October morning, but through a raised window came the sound of singing, and he distinguished the words of the famous old song of the college founder. He listened for a moment, smiling.

"What are the boys up to this early?" he asked himself. "It's not yet four o'clock." Then he bent once more over his papers, and only the scratch of his pen broke the stillness. Suddenly there came a muffled roar of cheering, and then from somewhere not far distant lusty voices swelled out into another stirring chorus.

The professor dropped his pen and rose to his feet, his hollow eyes shining. He remembered the many glorious occasions in his student days when he, too, had joined in that chorus, and a wave of deep feeling swept across him. Then a mist passed before his eyes; he swayed and caught at the back of a chair. All night long he had been working at the task in which his soul was bound up, "The Industrial History of Europe," which he hoped would bring him name and fame, and the strain was telling. He pulled himself together with an effort and stepped out upon the piazza for a breath of air.

Day was breaking, and the dim outlines of dormitories and recitation halls rose out of the gray mist veiling the campus. Early as it was, lights were shining from many windows, voices were calling, and vague figures were hurrying here and there. The song which had so moved the professor had died away, but from some distance up the elm-bordered street came the blare of a band and then more singing, this time a lively marching song.

An elderly man was coming up the sidewalk, and the professor, recognizing the college carpenter, went down the piazza steps to meet him.

"Good morning, Mr. Thornton. Can you tell me the meaning of this early manifestation of college spirit?"

"Why, sure, Professor! The football team leaves for New York this morning on the five o'clock train to play Princeton, and the whole college has turned out of bed to give them a send-off at the depot."

"Ah, yes, to be sure! How stupid of me not to remember! But my mind is very busy these days with my work."

The carpenter glanced keenly at the professor's haggard face.

"If you'll excuse my saying so, Mr. Wentworth, it looks to me as if your mind was too busy for the good of your health. You need to get outdoors and do some manual work. A little exercise with a beautiful tool like this would do you a world of good."

And he held up before the professor's eyes a saw that he was carrying under his arm. Long and shapely and shining it was, with back curving in like the blade of a sabre and decorated with artistic scrollwork blazoned with the name "The Simonds Saw." At the sight the professor was strangely thrilled; he was seized with a sudden great desire to grasp and possess and use that saw. Reed Wentworth had exulted in the use of tools when a boy at home; from his earliest recollections the sight of a fine tool had aroused in him strange longings which were not satisfied until he had entered his little shop in the back yard and fallen feverishly to work with hammer, chisel, or saw. That was years ago; fate had led him far away from his boyhood pursuits into fields where no carpenter's tool entered, yet the same instinctive desire to use tools still lay fast in his soul, waiting to be fanned into life by the mere sight of a handsome piece of steel and apple-wood like this.

"It's a dandy piece of kit," continued the carpenter, with enthusiasm; "goes through wood like a knife through cheese." And grasping the end of the saw in one hand, he bent it nearly double and let it fly back with a metallic whir that rang like music in the professor's ears.

"See how it keeps its shape?" Wentworth, running his eye along the teeth, saw that all were in perfect line.

"Feel the hang of it!" And he shoved the handle into Reed Wentworth's hand. Lovingly the professor gripped it, balanced it and tried its weight, bent the blade and ran his thumb along the teeth.

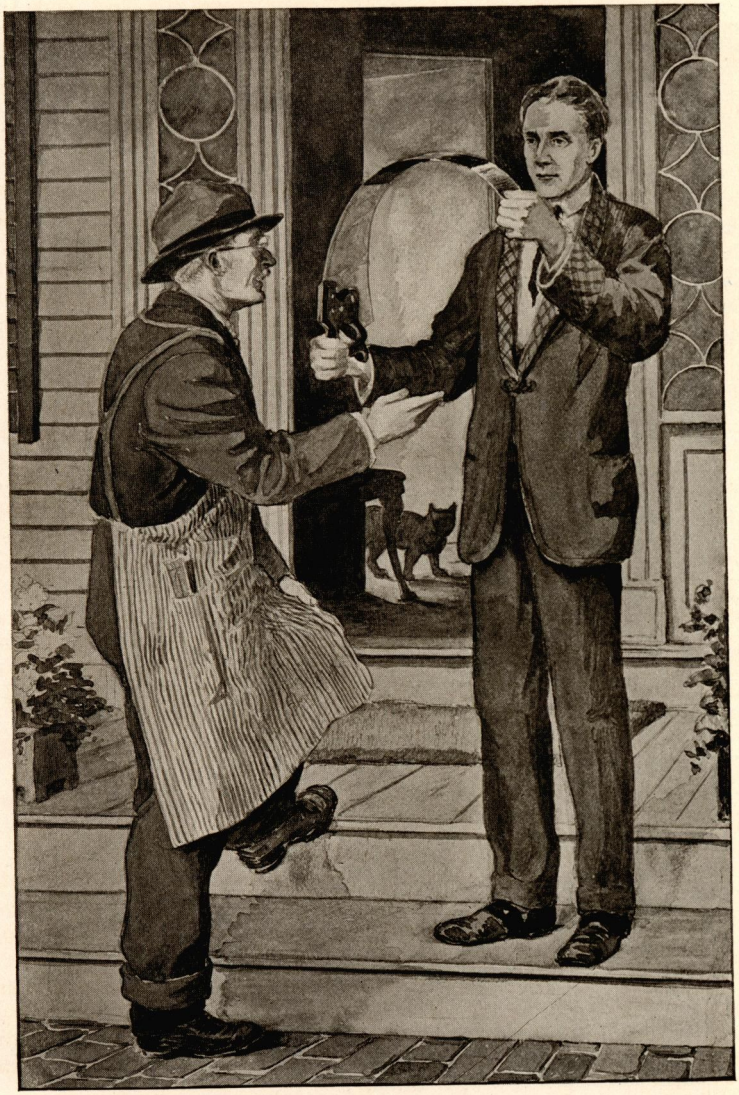
"You handle it as though you knew something about saws," said the carpenter, smiling shrewdly.

"I used to—once," answered the professor wistfully, returning the tool with a sigh.

"Well, you take my advice, Professor; run down to my shop and tinker around a bit now and then; it will take the hollows out of your cheeks. Pardon my plain speaking, but every one in this village likes you, Mr. Wentworth, and we hate to see a fine fellow wear himself out with the midnight oil as you are doing. So long!"

Reed Wentworth looked thoughtfully after him.

"Perhaps he's right," he muttered to himself. "The strain is severe, but I can't neglect my work."



"It's a dandy piece of kit," said the carpenter, enthusiastically

He turned and went up on the piazza.

The music and singing, which during the previous few minutes had grown fainter in the distance, now burst forth in full volume as the head of a procession emerged from behind the old dormitories crowning the rise on the opposite side of the campus. Slowly the long column of dark figures wound down along the village street and toward the piazza where the professor stood. Heading the procession marched the college band, their music pads lighted by the murky red flare of a dozen torches. Then came rank after rank of boyish figures, six abreast, many bareheaded, many clad in green sweaters, some in corduroy trousers, with a scattering of the little green caps with the white buttons that marked the freshmen. Rank by rank swung by in perfect marching order with springy step, the tramp of hundreds of feet drowned by the mighty chorus of their singing and the blare of the band.

The refrain echoed back from the dark hills, and Reed Wentworth was deeply stirred. On the top step of his little piazza he straightened and squared his shoulders like a soldier at attention, his eyes glowing, his lips parted.

Almost half the marching column had passed the house when a tall fellow striding at its side, a fellow wearing a big green sweater with the white varsity letter upon its breast and carrying a long megaphone, caught sight of the professor upon the piazza. He clapped the megaphone to his lips and roared an order down the line. The music and singing died away; the column halted.

"Fellows! we have all heard of 'Speed' Wentworth, the back who made the touchdown that won the '07 game with Harvard! There he is—Professor Wentworth! Come on, fellows—a long 'wah-hoo-wah' for 'Speed' Wentworth—*and make it good!* Hip!—Hip!—"

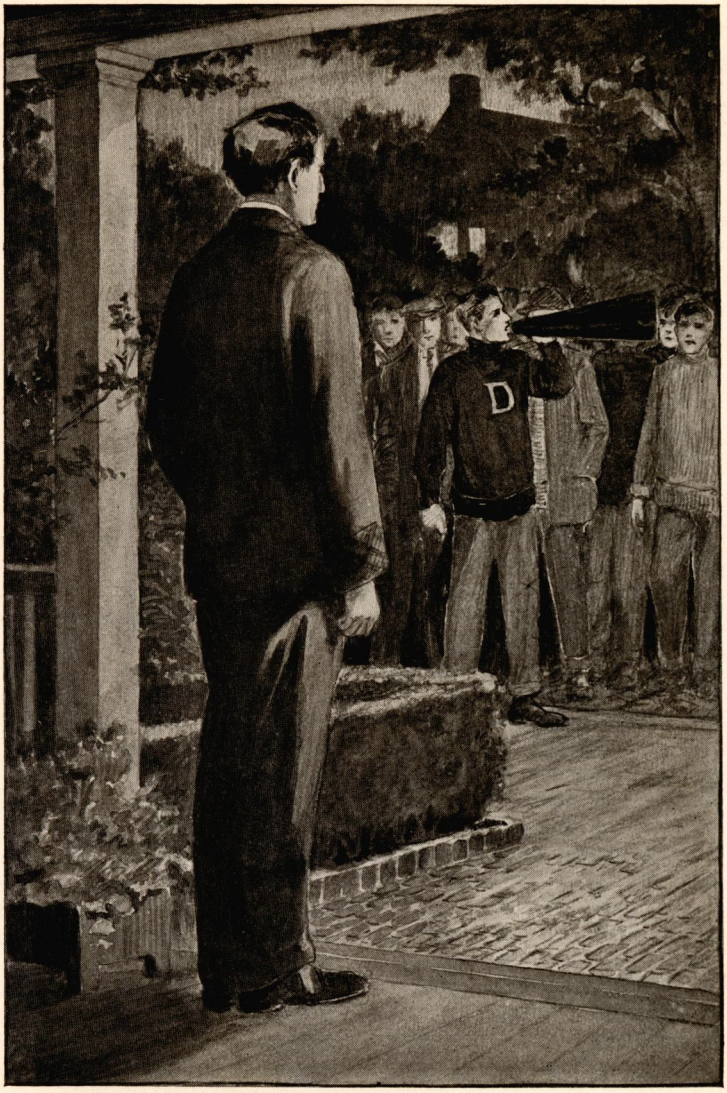
The megaphone dropped upon the sidewalk, and with clenched fists, bent legs, and swaying body the green-clad athlete led the cheer:—

"Wah-hoo-wah! Wah-hoo-wah! T-i-g-r! 'Speed' Wentworth! 'Speed' Wentworth! *'Speed' Wentworth!*"

The words crashed out in a deafening roar from a thousand throats. Quivering in every fibre, a red flush coloring his pale cheeks, and his eyes shining, the professor stepped forward to the edge of the piazza and raised his hand. To think that after all the years that had passed the men of his beloved college should remember the exploits of his student days and should pause to cheer him—him, the quiet and reserved recluse whose life was spent in the shut-in world of books!

The last echoes of the cheer died away, a wave of lusty hand-clapping ran along the line that faced the piazza, then silence, and Reed Wentworth spoke in a voice choked with emotion.

"Fellows, I thank you! I can't tell you how your tribute touches me"—his voice broke and he gripped the piazza rail. Then his words rang clear:—



"There he is—Professor Wentworth! Come on, fellows, a long cheer for 'Speed' Wentworth!"

"I, too, have marched in such a parade as this; I, too, have crouched behind the line for the quarter's signals; I have seen the men of this college by their gameness snatch victory from the jaws of defeat in many contests on gridiron, track, and diamond, and I know that just so long as the spirit of brotherhood and loyalty and fighting grit which has made this college famous stirs in the souls of her sons, so long need they fear no rival! Go out and win—My heart and soul are with you all!"

Another thunderous cheer, and then the column swung into motion. But hardly had the last rank passed the house when Reed Wentworth staggered, clapped his hands to his head, and with a moan sank down on the piazza, his brain a wreck. Overstudy had done its work.

II

WHICH INTRODUCES UNCLE SI, AND TELLS HOW THE PROFESSOR TOOK A STEP AFFECTING THE WHOLE FUTURE COURSE OF HIS LIFE

IT was a beautiful spring morning on the North Shore of Massachusetts Bay. Seven months had passed since Reed Wentworth's collapse. For weeks he had been delirious or unconscious, struggling with brain fever. Gradually the attack had passed, but it had left the professor in such a condition that the doctors had told him that for at least a year he could not teach or indulge in study. The college had granted him an indefinite leave of absence, and with his wife he had settled down in a little seaport town where careful nursing, rest, and the bracing sea-breeze had brought back his naturally good health and wiry strength.

But forced idleness was beginning to wear on the professor, and this morning as he sauntered along the beach he was particularly restless. Topping a hillock he saw the white timbers of a summer house in process of construction, with a dozen carpenters busily at work upon the scaffolding. The sound of hammering, the rasp of saws, and the sight of the brilliant sunlight shimmering upon the clean steel of the tools, all roused in Wentworth a thrill of desire.

"Strange!" he muttered, smiling to himself. "My ancestors must have been carpenters."

And then suddenly an idea flashed across him.

"By George—the very thing! It would build me up physically and make me forget my college work as nothing else could."

The carpenters at work on the new cottage began to knock off for dinner. One in particular Reed Wentworth noticed, as they were old friends. He was a thick-set, heavily built man of sixty, with a big gray beard covering

the lower part of his square, weather-beaten face, a black slouch hat tipped back on his wrinkled forehead, and a pair of nickel-bowed, half-moon spectacles covering eyes that twinkled with shrewdness and humor, set deep below bushy gray brows. A lead pencil was perched at an angle over his right ear, and his loosened collar showed a sunburned neck set squarely upon massive shoulders. "Uncle Si" was a contractor and builder of the old seaport in which Wentworth had been born and reared, a quaint and sterling character who loved to work side by side with his men.

As Wentworth approached, the veteran turned and walked to the rear of the building. Behind the cottage stood a horse hitched to an open wagon. Uncle Si undid the hitching strap, then pulled out an old yellow corn-cob, filled it, struck a match on the shaft, drew a few puffs, and was climbing up into the seat when the professor came up.

"Hello, Uncle Si! Going home to dinner?"

"Howdy, Reed"—he had known Wentworth since the latter's childhood. "Yup, goin' to tackle the eats. Out to walk?"

"Yes."

"Well, hop up and I'll give you a lift home."

"Thanks, Uncle Si," and Wentworth followed him up on to the seat.

"Giddap, Dan!" The contractor whistled merrily to his horse and they set out along the shore road toward the village at a smart trot.

"Your horse feels good and lively this morning, Uncle Si."

"Don't blame him, on such a corking day as this; and with a good square feed waiting for him in the barn!"

Wentworth nodded.

"Uncle Si, what sort of a carpenter do you think I'd make?"

The horse gave a quick flirt of his head at his master's involuntary whistle and surprised jerk on the reins.

"You!"

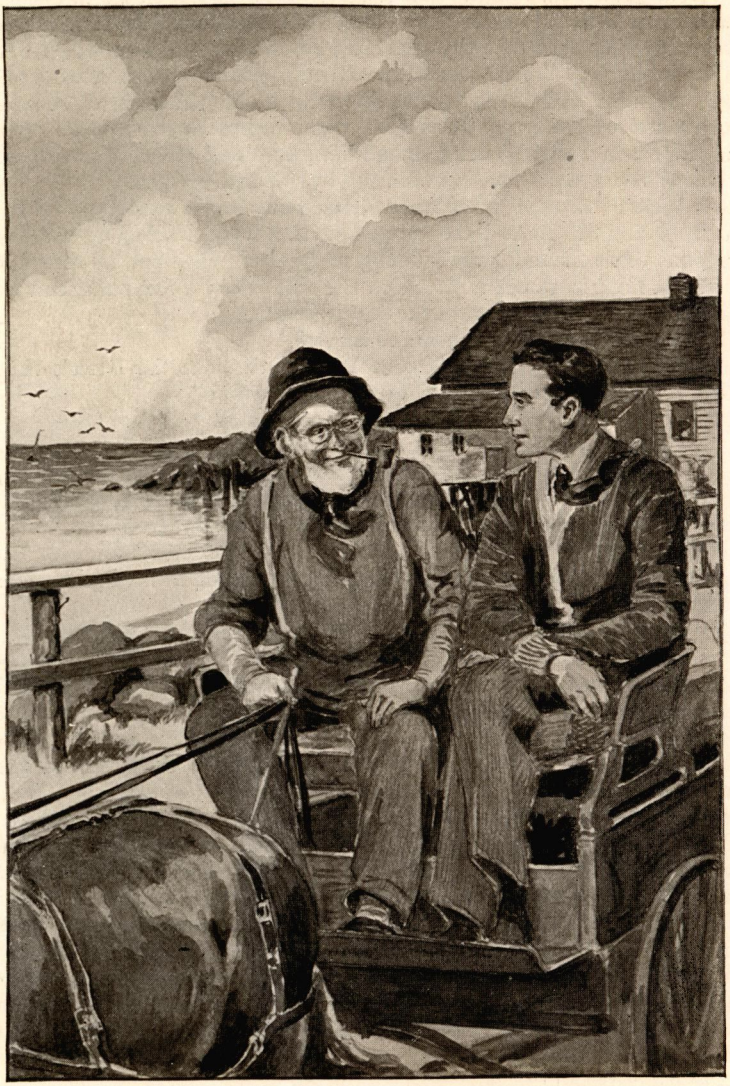
"Yes; do you want to take me on your gang?" And the professor smiled broadly at the amazed look on the old carpenter's face.

"Well, I'll be jiggered! What's the big idea?"

"It's just this, Uncle Si." Reed Wentworth spoke earnestly now, his smile gone. "As you know, I had a mental break-down last fall, and am down here recuperating from brain fever. The doctors won't let me teach or study for a year or more, and this enforced idleness is wearing on me terribly. What I need to build me up is some good, hard physical work. Now when I was a youngster I used to delight in using carpenter's tools, and in building traps and kites and sleds, and such things—but you know that, Uncle Si—don't you remember how you used to come into my little workshop and show me points in carpentry work?"

The old contractor's kindly gray eyes lit up with a pleasant smile.

"I sure do remember, Reed. You had a right smart knack at using tools. Told you you'd missed your calling when you set out to be a teacher!" And he chuckled heartily, slapping the professor's knee.



"Your horse feels good and lively this morning, Uncle Si"

"Well, many times during my years of teaching the strong desire has come over me to be back again at work with saw, hammer, and chisel in my old workshop, and the idea came to me that if you would take me on as a helper it would make a new man of me. I don't care a rap about the amount of pay; I am fortunately fixed financially; all I want is the chance to work and build up my health. Will you give me that chance, old friend?"

Uncle Si threw back his gray head and blew the smoke of his corncob slowly upward from lips and nose, while the horse jogged peacefully along the sandy road with the reins trailing loosely over his haunches. Then he looked down, knocked the ashes from his pipe against the side of the wagon seat, and clapped the professor on the shoulder.

"Yes, by gosh, I will! Being a carpenter is far from a cinch—but I'll take chances on your spoiling more work than you finish. You used to be a husky young fellow, and you don't look very feeble now." And his keen eyes passed approvingly over Reed Wentworth's broad shoulders and well-built body.

"I thank you heartily, Uncle Si! Teaching has softened my muscles, and my sickness has left me without my full strength, but I guess I can stand the gaff if I start in gradually."

"Sure, Reed! Tell you what you do—tinker around in my shop and take it kind of easy at first; then as you get limbered up you can tackle the heavier, out-doors work. I'll teach you the ropes; mighty glad to do it—don't thank me!—it'll seem like old times." And once more the kindly smile lighted up his bearded face.

"You can work for me as long as you like, Mr. Professor-Carpenter! But here we are at your gate. Whoa, Dan!"

The wagon stopped before a pretty little cottage.

"I'm mightily obliged to you, Uncle Si. I'll invest in some flannel shirts and a pair of overalls to-night and be down to your shop early to-morrow morning. It's splendid to be able to look forward to doing some real work again!"

Wentworth jumped to the ground, and the old carpenter, smiling at his boyish enthusiasm, reached down and gripped him warmly by the hand.

"That's the dope, Reed! So long."

"So long, Uncle Si."

With a nod and a shake of the reins the contractor rattled away, leaving Reed Wentworth standing by the hedge in the happiest mood which had possessed him for weeks.

Thus was the agreement made, and the professor of economics and history admitted to the noble trade of the carpenter.

III

DESCRIBING THE REGENERATION OF OUR PROFESSOR AND A MODEL CARPENTRY KIT, WITH A LITTLE CHAT ABOUT SAWS AND OTHER TOOLS



NCLE SI, this saw isn't hung right, for one thing!"

Months have passed, and now behold our college professor, bareheaded, clad in a gray flannel shirt unbuttoned at the throat, a dusty pair of overalls, and brown sneakers, with sleeves rolled up above the elbows and beads of sweat glistening on his forehead. He looks as fine a specimen of vigorous manhood as one could find —so much have manual labor, a rested brain, and good sound sleep done for the pale and haggard student of a year ago!

As Uncle Si had said, Wentworth had found the carpenter's trade far from a "cinch" and by no means easy to master. Every day of his apprenticeship had taught the professor new and valuable lessons and given him increased respect for the sturdy, intelligent men at whose side he worked. As the weeks went by his esteem for the splendid calling of the carpenter had grown. He had received many hard knocks, but his genial and unassuming nature had pulled him through and won him the warm regard of the men with whom he worked. His natural cleverness in using tools and his quick and resourceful mind had as time passed made him a master of fine carpentry whose beautiful workmanship was the admiration of all.

"Oh, Uncle Si, come here and look at this saw!" called Wentworth again. It was about five o'clock of a beautiful afternoon, and the slanting rays of the autumn sun were shooting through the windows of the carpenter shop and lighting up with warm and mellow glow the piles of clean white lumber, the heaps of yellow sawdust, and the shining tools strewn over the benches along the walls.

Our friend, the old contractor, laid down the chisel he was sharpening on an oilstone at the other end of the shop and came across.

"What's troublin' you, Reed?" he asked, glancing keenly over his spectacles at the saw the latter held.

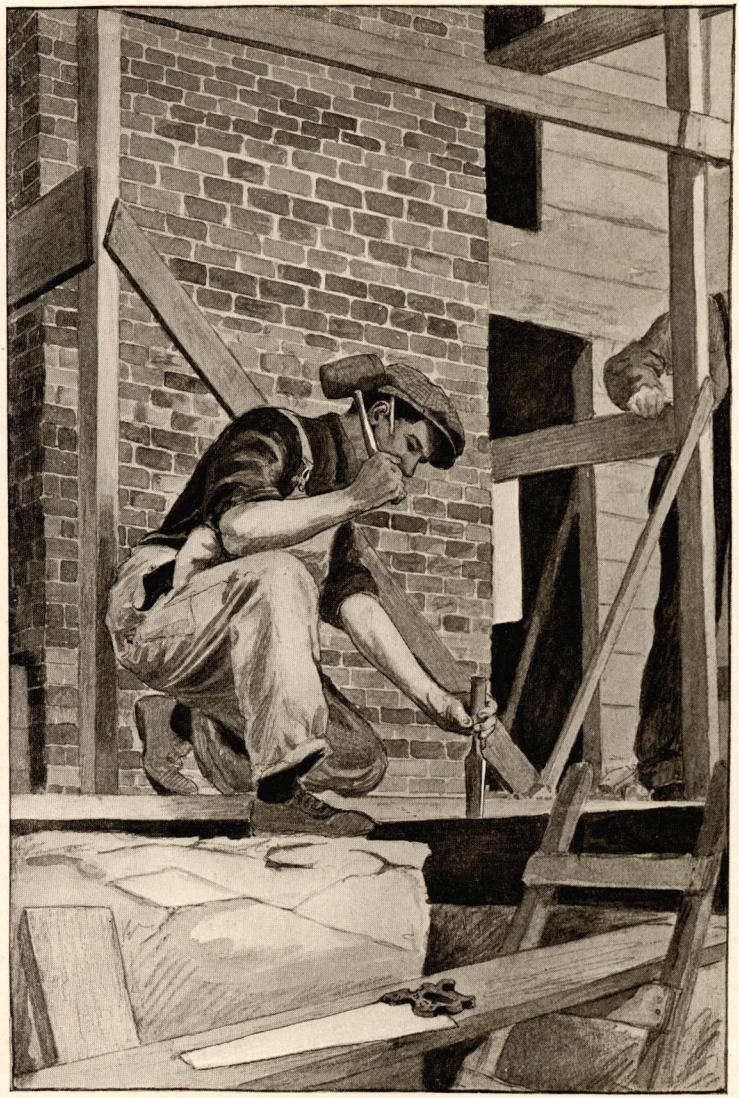
"I've found out why using this saw takes hold of the muscles so."

"That so? Mighty glad to hear it; it's been puzzlin' me why the cussed thing tuckers my arm out after a spell. What's the answer?"

"Just this: the handle of this saw is fitted to the blade at such an angle that in using it most of the pressure comes on the upper part of the hand, instead of on the ball of the hand in direct line with the elbow, and this faulty adjustment of course causes more muscular strain."

"Reckon you've struck oil, Reed. Usually do."

Wentworth laid the saw on the bench and picked up another, a beautifully finished tool of highly polished steel and apple-wood.



As time passed, Wentworth's esteem for the splendid calling of the carpenter grew

"I tell you, Uncle Si, there's no saw any better than the Simonds saw! I have tried all of the other makes, and I don't like to use any other saw. None of the others gives any better satisfaction. They are apt to bind and choke the work, or do not hang just right, or the handle is not fitted to the blade so as to give the least muscular strain in using, or they are apt to lack the edge-holding, the keen and fast cutting qualities, the temper and finish of the Simonds."

"Right you are, Reed. I could have handed you that dope years ago," said the old carpenter, with a twinkle of amusement in his shrewd gray eyes. "I've used saws ever since I was a little shaver just able to stand up to a bench—it's over fifty years this winter—and gimme a Simonds saw every time. Most every carpenter I know says the same; we all like it because it's got as many good points as a porcupine and because there's an iron-clad, bull-dog, hold-fast, double-jointed guarantee back of it that means just what it says."

"Well, Uncle Si, the Simonds people ought to be able to make a good saw. They have had experience with manipulating steel for eighty-two years, and they operate their own steel plant, which produces the best and toughest of high-grade saw-steel, and this steel they temper by a special process guaranteeing uniformity throughout the entire saw and enabling it to do fast and accurate cutting. The blades are ground to an even gauge all along the tooth edge and are uniformly thinner on the back, thus making a light-running saw that does not bind in the kerf, holds its cutting edge, saws true, and has an easy, comfortable hang—but I don't need to tell you all this," he broke off, smiling.

"That's all right; shoot ahead with the lecture, Mr. Professor-Carpenter," chuckled Uncle Si. "You seem to be pretty well posted on Simonds saws."

"Well, I *am* interested in them, because I love a fine tool of splendid workmanship. The first time I laid eyes on a Simonds saw was on the morning of my break-down at college, and its handsome appearance attracted me at once, although I then knew but little about tools."

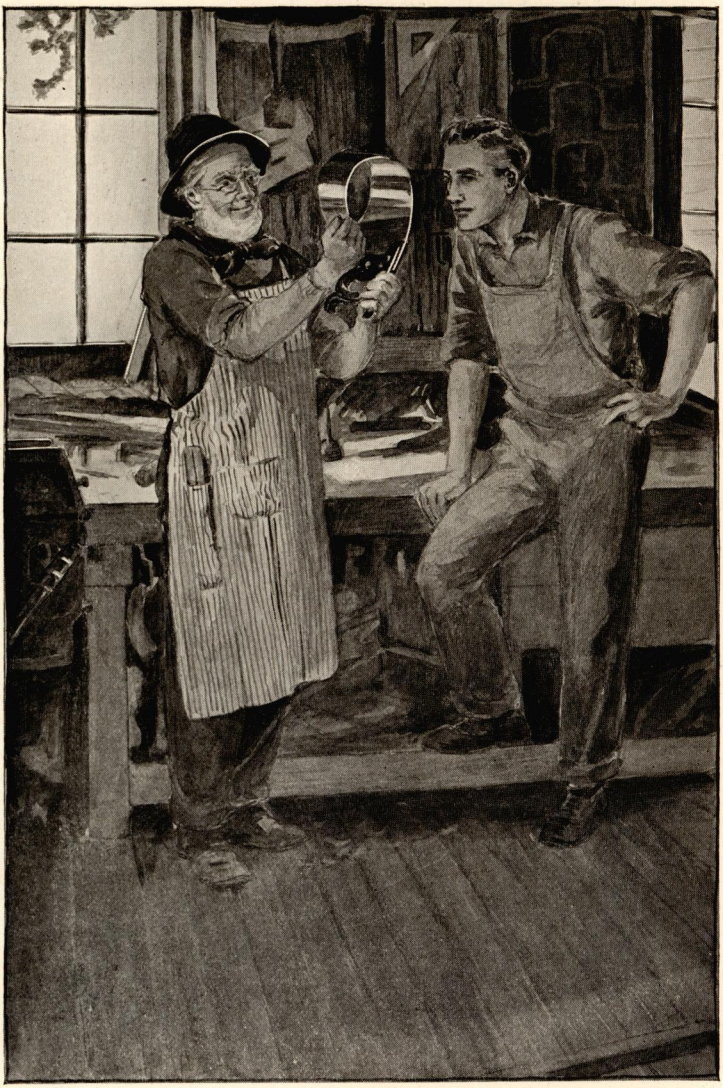
"Speakin' of the stock in them, I know a feller who chopped a piece out of an old Simonds saw and made himself a mighty slick razor out of it. The Simonds sure is the equal of any saw I ever ran up against for staying sharp. The teeth are like needle points and it takes an all-fired amount of cutting to dull 'em. Swell-lookin' saw, too, ain't it?"

The old carpenter took the saw from Wentworth's hand and held it up so that the sunlight flashed from its clean bright blade and the brass screws and carved and highly polished apple-wood handle.

"There's about as much difference between its looks and the looks of some other saws as there is between a Pullman and a hand-car. But handsome is as handsome does, and this saw has got the goods to back up its looks; it sure does go through a board fast and straight and clean—I never saw the beat of it! Saws are a lot like folks. Some are too cranky to have around, while others are always good-natured and willing and



"I tell you, Uncle Si, there's no saw any better than the Simonds saw"



"This saw has got the goods to back up its looks," said Uncle Si

never get tight or balk when half through a job—and that last hits the nail plumb on the head for the Simonds saw."

Wentworth nodded.

"Did you finish sharpening that chisel, Uncle Si? I want to have a little talk with you."

"All right, Reed, go to it. But let's have a seat first," and he pulled forward a nail keg. Wentworth cleared the shavings off a corner of the bench and jumped up.

"You know I had a talk with the town school committee a while ago about starting a manual training course in carpentry in the high school," he began. "Well, it looks as though the matter were going through, and meanwhile I have made out a list of what I considered the necessary tools to be included in a manual training school carpentry kit. I want your criticism of it."

He drew a slip of paper from his hip pocket.

"It seemed to me that it would be wise to start out by giving each boy only the absolutely essential tools in order to keep down the cost of the outfit. There is no need of supplying each boy with some of the tools, for they are not used frequently enough; a few of each could be kept by the instructor and passed out for common use as needed. Later on the individual kit could be increased as occasion demanded and finances allowed."

Uncle Si clasped hands over his crossed legs and nodded.

"Here's the list. First, in the individual kit, one medium-sized hammer. A few brad hammers could be included in the general outfit."

"And be sure and get a hammer with a good balance and swing, and with a deep claw which tapers fine enough to draw small-headed nails," interposed the old carpenter.

"Point noted," said Wentworth, smiling. "Second, three saws: a rip saw and a cross-cut hand saw, both with 22″ or 24″ blades, and a 12″ back saw. A few compass saws would serve for the whole class."

"Righto. And as too coarse a saw is kind of hard on small muscles, better give your boys rips with about seven and cross-cuts with ten points to the inch."

"Next, four chisels—I think that would be enough for the kind of work we'd do. Say an inch and a half, an inch, three-eighths, and a quarter. Agree with me?"

"Yup."

"A bench knife would also be necessary."

"A thick-bladed shoe knife would fill the bill to a T, Reed."

"A spoke shave; an iron one which can be adjusted to cut a thin or thick shaving. A try square and a two-foot folding rule. A few hatchets would serve all the boys in common."

"Same with bits and bit-stocks, Reed. The bits would be getting lost or broken or dulled all the time—I know what a gang of youngsters is. Put a bit-stock at each bench and let several fellers use it, and let the

instructor keep a tray of bits, of say six different sizes,—an inch, five-eighths, three-quarters, a half, three-eighths, and a quarter inch,—and hand 'em out only when they're needed."

"I agree with you, Uncle Si. Next, a whetstone for each boy."

The builder brought his heel down on the floor with a thud.

"Kee-rect! And by jimminy, see that he keeps a gol-darned good edge on his tools! There's nothing will spoil the job like a dull edge. Why don't you specify the fine-grade stone that comes in an iron box with a felt pad soaked with oil under the stone—it keeps the stone well oiled and in fine condition, ready for use all the time."

"Good point, Uncle Si. And I believe in having an electric grindstone if possible. Next on the list, a scratch gauge and a wooden mallet. Nail sets, screwdrivers, and gimlets could be used in common."

The veteran nodded. "Better specify the screwdriver which comes with three detachable blades of different sizes, 'cause these blades can be put into a brace for rapid screwing."

"Gouge, level, and calipers could be used in common by the boys at one bench, so there would be a saving of money there. Rasp and file and steel cabinet maker scraper would also be needed, but I don't think they need form part of each boy's kit."

"Sure not, Reed."

"Then I have included three planes,—a jack plane, fore plane, and smoothing plane,—and a bevel."

"Might leave out the fore plane, and have a few for general use, Reed."

"Yes. Then wood hand screws, breast drill, and an expansive or extension bit should be included in the general equipment, it seems to me, while wooden bench hooks are also handy."

Wentworth paused, and his companion asked, "That the end of your list?"

"Yes; would you include anything else?"

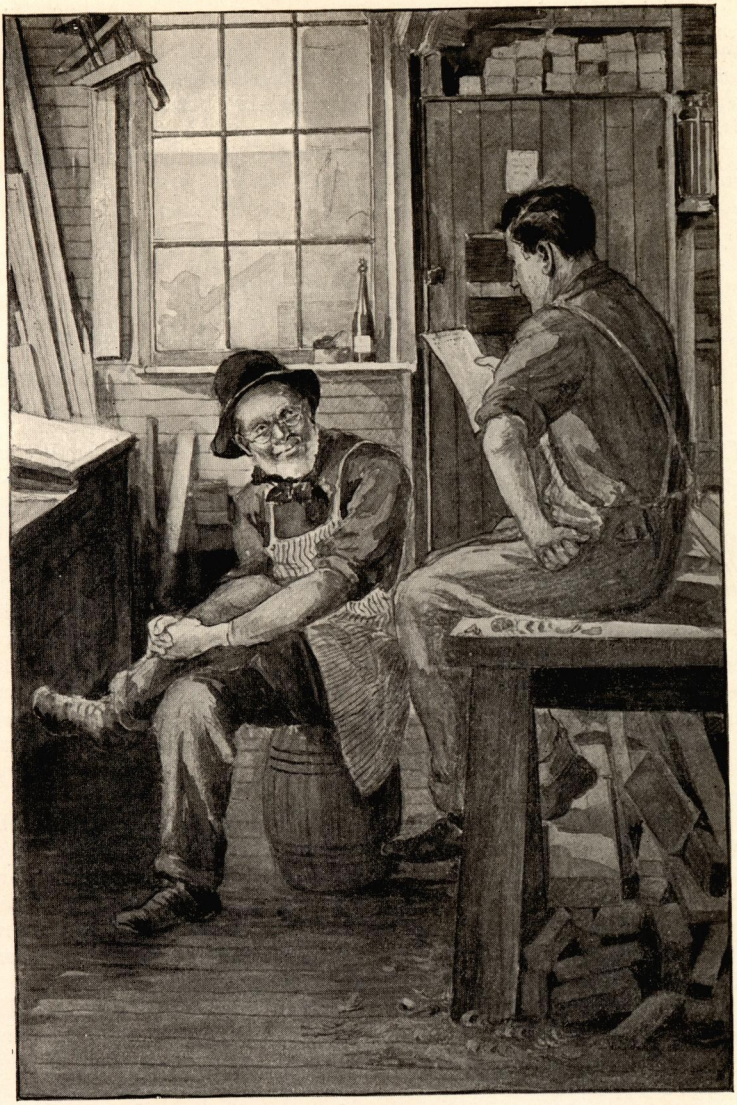
"Read off the list again."

"All right, Uncle Si. First, these tools should be included in the individual kit:—

Medium-sized hammer	Try square	Jack plane
Rip saw	Two-foot rule	Smoothing plane
Cross-cut hand saw	Whetstone	Fore plane
Back saw	Marking gauge	Bevel
Bench knife	Mallet	
Spoke shave	Four chisels	

"Second, to be included in the general equipment:—

Compass saw	Gimlets	Steel scraper
Hatchet	Gouge	Brad hammer
Bit-stock	Level	Hand screws
Six bits	Calipers	Breast drill
Nail set	Rasp	Expansive bit
Screwdriver	File	Bench hook"



"I reckon that a purty complete list, Reed, for the kind of work you'd do in school"

Uncle Si reflected a moment, and then said:—

"I reckon that a purty complete list, Reed, for the kind of work you'd do in school. Seems to me every tool you'd need to start with is there. Of course special kinds of carpentry call for special tools, and you'd probably find in time you needed to increase your kit, but I guess that list is O. K. for a starter. Better not stock up too heavily at first."

"Well, I thank you, Uncle Si. But it's nearly dark; let's go home to supper."

A hearty exchange of "good nights," and the two men went their ways.

IV

WHICH TELLS HOW THE PROFESSOR FOUND HIS PROPER CALLING, AND HOW A HARD-HEADED BUSINESS MAN WAS WON OVER TO THE CAUSE OF MANUAL TRAINING



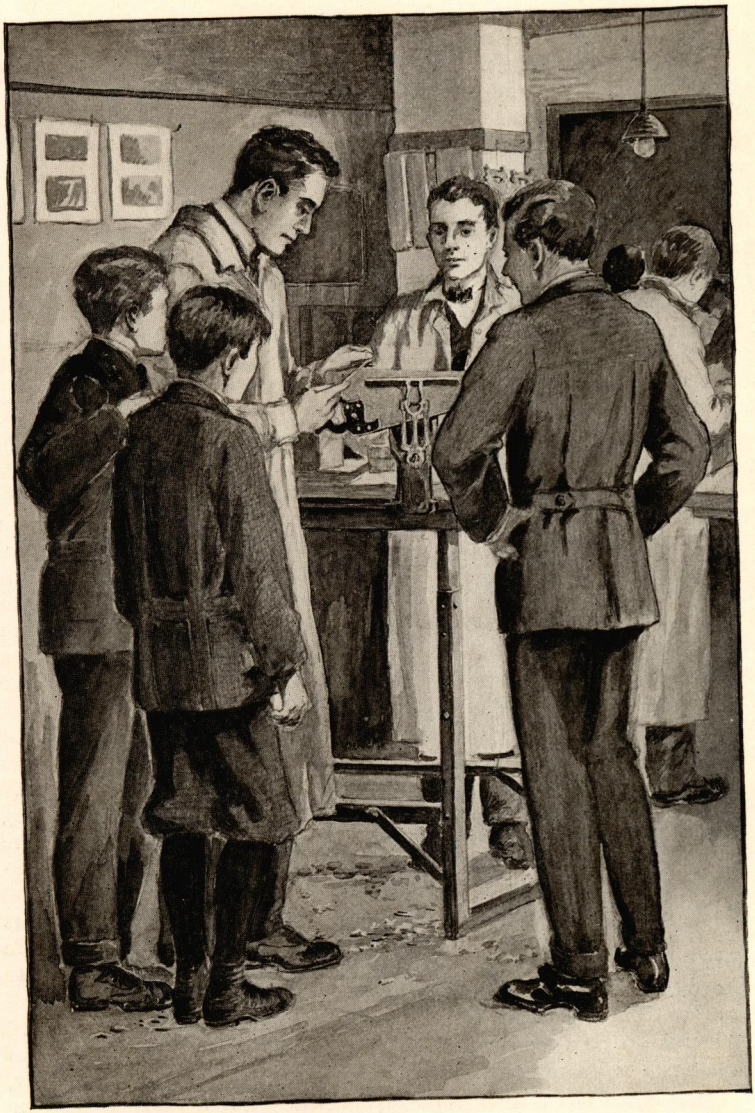
ON'T point your file toward the heel of the saw, Brown; let me show you the right way."

Two months had passed since the talk in Uncle Si's carpenter shop, and Reed Wentworth was speaking to one of a group of boys busily at work in the improvised carpenter shop of the town high school. The school committee had voted to install the manual training course in carpentry that the ex-professor had proposed to them, and had named him as instructor. A large vacant rear room on the ground floor of the high school building had been fitted up as a workshop under his supervision, equipment purchased, and the project launched. From the first it had been a success, and the old college football player's winning personality had drawn into his classes a very large part of the boys of the school.

"You see, Brown," Wentworth went on, readjusting the boy's saw in the clamp, "in filing a saw a much better angle or bevel on the front of the tooth can be obtained where it is required by pointing the file toward the *toe* of the saw. Some people, it is true, point the file toward the heel, but this way will give you better results. Mr. William Miller, the expert of the Simonds Manufacturing Company, settled the question a short time ago in a letter to one of the magazines on manual training."

Straightening up, Wentworth found a man standing at his side. He was tall, thin, and angular, with hawk-like face, sharp little steely eyes, and a tight slit of a mouth. His seedy clothes and general air of utter indifference to appearances certainly did not betray the fact that he was John R. Lancebridge, wealthy manufacturer, and a power in town affairs.

"Good morning, Mr. Lancebridge," said Wentworth, smiling genially. "What can I do for you?"



"In filing a saw a much better angle can be obtained by pointing the file towards the toe"

"Nothing in particular, Mr. Wentworth; just dropped in to take a look at your carpenter shop," came the answer in a slow, nasal drawl.

"Very glad you did, sir. The course is something new for this town, as you know, and we haven't yet quite got things running as we hope to have them later, but still I am confident that if you look into it you will find that the boys get a lot of enjoyment and satisfaction and real benefit from the work."

"Well, Mr. Wentworth, that's just what I've been doing—looking into the matter. To be perfectly frank with you, sir, when this scheme was first brought up before the town I took mighty little stock in it. I'm an old-fashioned man, sir, and most of these new-fangled ideas in school training don't appeal to me. When this carpentry course was put into the schools I believed and said that it wouldn't amount to a row of pins, that it would only take the boys' minds off their studies and result in their fooling around and turning out a lot of worthless wooden gimcracks of no practical use to any one."

"Others thought the same," smiled Wentworth.

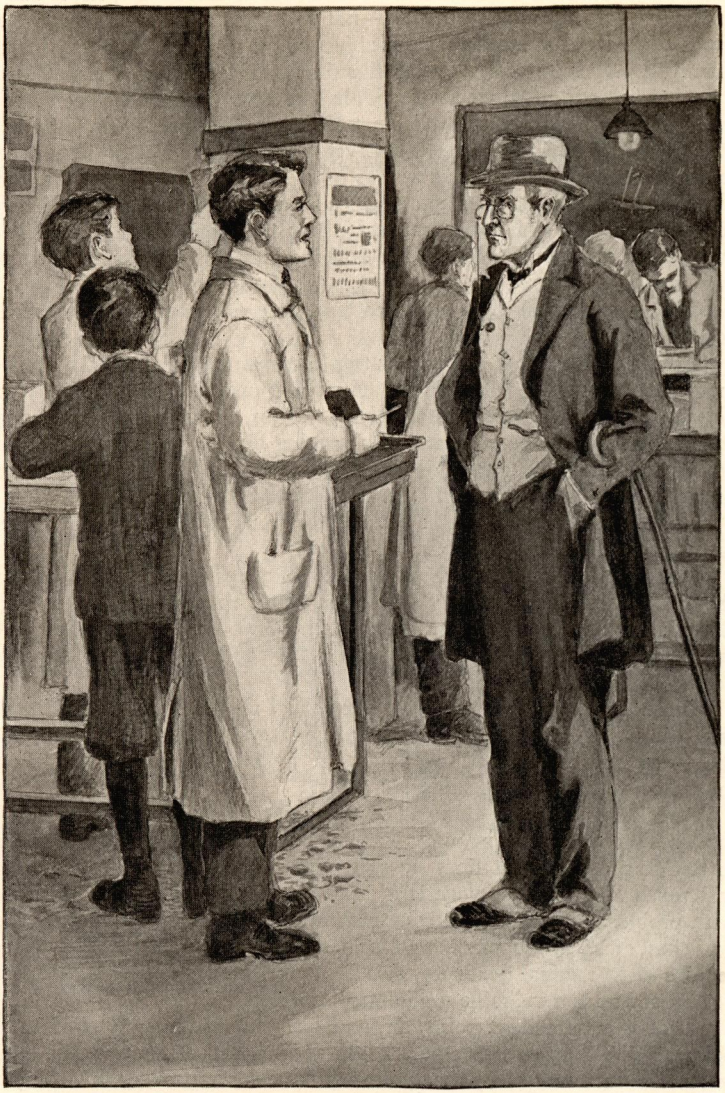
"Well, sir, I've begun to think differently. I'm interested in the schools and I've been investigating the matter,—talked with the boys about the work, got opinions from worth-while men, etc. More than that, I've been studying my nephew, who is a pupil of yours. He's always been a thin, pale-faced youngster who cared for nothing but curling up in an arm-chair and losing himself to the world in a book. He could reel off history like a talking machine, but didn't know beans about anything practical—couldn't saw a board off and do it right. When your course was started he put up a holler when my brother insisted on his taking it—said it would take too much time from his studies and interfere with his preparing for college; he didn't intend to be a carpenter and didn't care to know anything about carpentry work, etc.!"

Wentworth broke out into a hearty laugh. "Look at your nephew now," said he, nodding toward a tall boy across the room who was busily showing his neighbor how to bore through a board without splintering the opposite side. "Doesn't look as if he hated the work, does it?"

An amused glimmer lighted up Lancebridge's hard gray eyes.

"This is the point I was driving at, Mr. Wentworth. Since the boy has been working under you a remarkable change has come over him. He thinks and talks and is interested in something beside books; he's begun to wake up and take an interest in the practical things of life—amazed his dad the other day by showing him a tool cabinet he'd made for the garage, and it was a darned good one, too. He tinkers around the place outside of school hours and is developing physically; has brightened up wonderfully, when he used to act as though he were doped. In a word, sir, something has put new pep and vim in him and broadened him out both physically and mentally, and I believe it's your course in carpentry work."

"Mr. Lancebridge, your nephew's case is one among many similar that



"Something has broadened out my nephew both physically and mentally, and I believe it's your course in carpentry work"

have come under my observation. Our object in this course, sir, is not to turn out a lot of young carpenters—not to fit the boy for the carpenter's trade. We are convinced that the object of the modern school curriculum should be to turn out fully developed and many-sided brains, and we believe that that brain is only half developed, half educated, which has been denied the development which comes from training in motor activity. We hold that the really well-educated, fully developed young man should know how to do things with his hands as well as with his brain; that he should know something about woods and materials, tools and machines, and problems of construction,—all eminently practical things that come into modern life at every turn; that he should be able to make himself useful in home, camp, and farm."

"That is something that the town boy needs far more than the country boy."

"Exactly. Now such a course as this in carpentry aims to make of a boy more than a one-sided individual; it gives him a chance to employ and develop his creative and constructive faculties, gives him handiness and good ideas of craftsmanship and art; teaches him to be accurate in observation and careful in detail; develops his mental and physical powers, and accustoms him to making his hands and brain work together."

"And it should appeal to the active, boisterous young fellow who doesn't care a great deal for books, Mr. Wentworth."

"Just so. It breaks up the monotony of plugging away at books and shows the live-wire, nervously active youngster that the school has something in his line to offer him. I am a firm believer, Mr. Lancebridge, in our schools making in the courses which they offer as broad an appeal as possible."

"Quite right, sir; quite right. The school should supply something to take the place of the chores which the country boy has to do, but which the town boy knows nothing about. I believe that every boy should know how to build useful things."*

"And have you ever thought of this point, Mr. Lancebridge: that by taking this course in manual work a boy will be aided quite a little in deciding along what lines he will pursue his future education, for it will teach him whether vocations involving book study or those dealing with problems of design and construction appeal to him the more. Most branches of scientific work, and professions like surgery and dentistry, require great manual dexterity, and for these callings the high school carpentry course is a valuable preliminary training."

"That is an excellent point, sir, and one that has not occurred to me before. Yes, I agree with you. I am thoroughly converted, Mr. Wentworth; and for any plans that you may have for improving this course or adding to its equipment, count upon my hearty support. I am glad to

*For instructions in building a canoe, desk, ice-boat, curio cabinet, flat-bottom rowboat, book shelves, and serving table, see further on.

see that in equipping your boys you have made a happy choice of tools; for example, I see that you use only the Simonds saw. It is my business, sir, to know something about steel and builders' hardware, and long experience has taught me that there is no saw on the market that in all-round excellent qualities is better than the Simonds. As the couplet says,

"'*If you want saws that cut like diamonds,*
Ask for saws that are branded Simonds.'"

"Your experience coincides with mine, Mr. Lancebridge."

"But I must be going. Good day, sir."

"Good day, and thank you for your offer of help."

And so ended an interview which decided the permanence of Wentworth's course in carpentry and left him to pursue in happiness and contentment his duties as instructor of manual training, in which splendidly useful calling we will now leave him.

On the pages immediately following are directions for building a canoe, a flat-bottom rowboat, a curio cabinet, a desk, book shelves, a serving table, and an ice-boat, which boys, either at home or in manual training schools, can construct. The last pages of the book show some of the saws made by the Simonds Manufacturing Company of Fitchburg, Mass., which are suitable for industrial training schools, home, carpenter shop, and machinists' use. If your dealer cannot supply you, write us.

If you contemplate starting a manual training course or a vocational school in your town, or have any problems that arise from a manual training course which you already conduct, perhaps we can be of assistance to you and we sincerely hope you will not hesitate to call upon us.

The Simonds Manufacturing Company was founded in 1832 by Abel Simonds, who began the manufacture of scythes at Fitchburg. In 1868 the Simonds Manufacturing Company was incorporated, with George F. Simonds, Alvin A. Simonds, Thomas T. Simonds, Daniel Simonds, and Edwin F. Simonds as its charter members. It specializes in the manufacture of cutting edge tools. It has five factories and eleven branches.

We hope we are not imposing upon your kindness in asking for an acknowledgment of the receipt of this book. It would be very gratifying to us to receive also your opinion of it, and to know if it has been of any assistance or interest to you.

HOW TO BUILD A CANOE, A FLAT-BOTTOM ROWBOAT, DESK, CURIO CABINET, ICE-BOAT, BOOK SHELVES, AND A SERVING TABLE

I

A CANOE

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First set up a heavy plank on two strong trestles (*Z* in Fig. 1, Plate 1). Mark centre and a line 4′ each side of centre. Make one mold or form like *A* and two like *B*. Strips to be bent must be pliable and softened by immersion in boiling water or steam for hours. Fig. 2 shows exact dimensions for one half of mold *A*, Fig. 3 is one half of *B*. When molds are made set big one *A* on centre line of plank and nail it securely; the two smaller ones, *B*, are fastened to the 4′ lines. Next fasten to each end of plank curved piece shown in Fig. 5. Exact curvature of this 50″ oak or ash strip is indicated by the figures. It is shaped by being softened and bound to a form as shown for several days. The first two long strips or gunwales, *W*, are screwed to the stem and stern pieces and to the molds. Temporarily fasten the pair *X* and the pair *Y*. Skeleton of canoe will now look like Fig. 1 in Plate 1. Fig. 7 shows joint and shape at ends of the long strips. The ribs should be green elm, hickory, or ash, ⅜″ thick and 1½″ wide and long enough to make the curve from gunwale to gunwale. The centre or longest one (*R* in Fig. 6) should be put in first. It goes outside of *X* and *Y* and inside gunwales *W*. Ribs are placed 1″ apart and fastened with galvanized nails. The boiling or softening of the ribs may be done by making a steam-tight box (Fig. 2, Plate 2). The opening in the top is set over a vessel of boiling water and the ribs are placed in through the open end. In this way one burner on a gas stove may be made to keep the box full of steam. After a night's immersion in hot vapor ribs can be bent without breaking or cracking. When ribs are well set after being in place two days, remove *X* and *Y*. Fig. 3 is an iron pipe 4″ in diameter with one closed end driven into ground at angle shown. It is filled with water and a bonfire built under it. Strips may be placed inside the pipe and by maintaining a hot fire this makes a fairly satisfactory apparatus for steaming the ribs. Then remove the plank and substitute a strip 2″ wide and 1″ thick, long enough to run along bottom of canoe and be fastened to the curved stem and stern piece. Cover the framework either with canvas or planking or both. Fig. 1 in Plate 2 shows planking process, cypress 3″ wide and ¼″ thick being used, shaped like siding or clapboards used on houses, one board overlapping the other. Begin at centre and work to sides, using clout-nails clinched on inner side as shown in Fig. 5. The joint used in fastening the long bottom piece to stem and stern is shown in Fig. 4. Fig. 1 in Plate 3 shows canvas used as covering. Canvas should be extra heavy and may be used without planking, *i.e.*, it may be nailed directly on the skeleton framework. Lay a wide strip of canvas on framework and tack centre line to centre line of canoe bottom strip, using copper or galvanized tacks. Stretch it, leaving no wrinkles or fulness, cutting it with shears at ends and lapping it over 2″, snipping off surplus. A coating of glue may be put on canvas to shrink it and fill up meshes, but it is of no use unless it is afterwards covered with three good coats of paint inside and outside. The deck shown in Fig. 3, Plate 3, is next put in and a thin strip of molding nailed along edge of canvas to gunwales, also an outer stem and stern strip, *A*. A long 2″ board or keel is nailed to bottom

outside canvas to prevent injury to same when boat scrapes the bottom. Fig. 8 shows floor; Fig. 7 is sectional view of it. Fig. 2 shows seat; *C* is one of inside strips to support it. Fig. 6 is a brace used in centre of boat. Notice it under sail in complete sketch. Canoe may now be varnished on inside.

Figs. 2 and 7 in the next plate show plans for sail and paddle. Fig. 4 shows size and shape of leeboards, which extend down over sides of the boat into water. Fig. 5 is view of same. Fig. 6 shows how leeboard device is clamped to boat at point *X*. The whole thing, including sail, may be lifted off or added to any canoe. Fig. 3 is a homemade cleat for swinging the sail. Base of mast rests in a block (Fig. 9) and passes through a strap (Fig. 8) made from a heavy tub hoop.

An estimate of the cost is less than $10.

Base (temporary).—One piece, 14′ x 4″ x 2″ pine.
Stem pieces.—Four pieces, 34″ x 1¾″ x 1″ oak.
Gunwales.—Two pieces, 16′ x 1″ x 1″ oak.
Side strips (temporary).—Four pieces, 16′ x 1″ x 1″ oak.
Ribs.—190′, 2″ x ¾″ ash, elm, hickory, or cypress.
Planking.—275′, 2″ x ¼″ x $\frac{3}{16}$″ cypress.
Keel.—One piece, 14′ x 3″ x ½″ oak.
Seat raisers.—Two pieces, 14′ x 1″ x 1″ oak.
Seats.—10′, 1½″ x 1½″ oak.
Thwart.—One piece, 31″ x 3″ x ⅜″ oak.
Fenderwale.—Six pieces, 16′ x 1⅛″ x 1¼″ cypress.
Deck.—Two pieces, 12″ x 6″ x ½″ cypress.
Canvas.—28″ wide x 18′ long.
Paddle, sail, and leeboards.—Dimensions given in cuts. Paint—2 gallons.

FIG. 2.

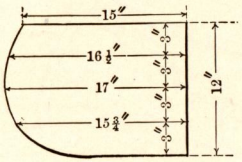


FIG. 4.

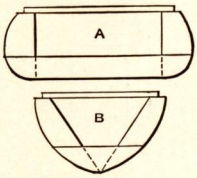


FIG. 3.

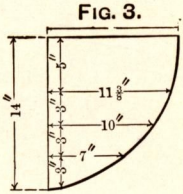


FIG. 1.

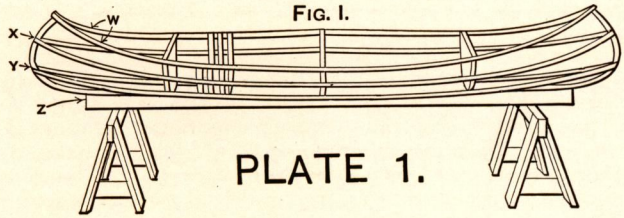


PLATE 1.

FIG. 5.

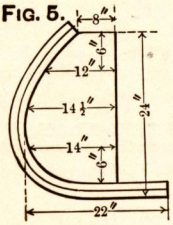


FIG. 6.

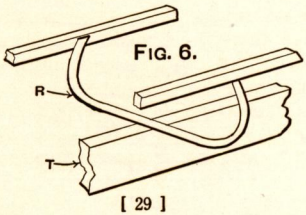


FIG. 7.

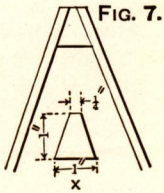
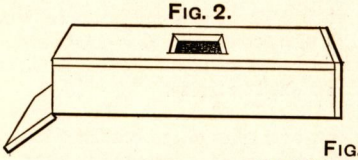


FIG. 2.



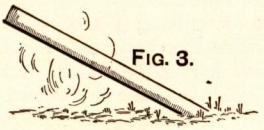


FIG. 3.

FIG. 1.

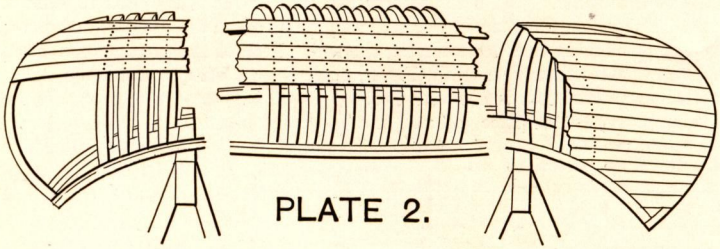


PLATE 2.

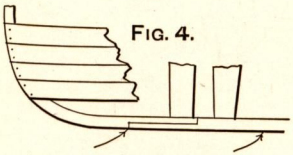


FIG. 4.

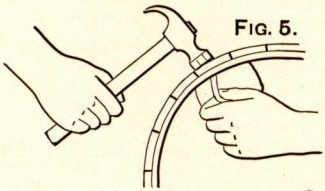
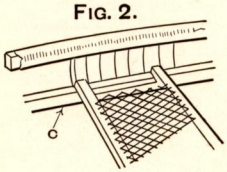


FIG. 5.

FIG. 2.



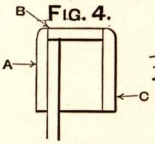


FIG. 4.

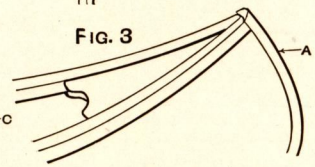


FIG. 3

FIG. 1.

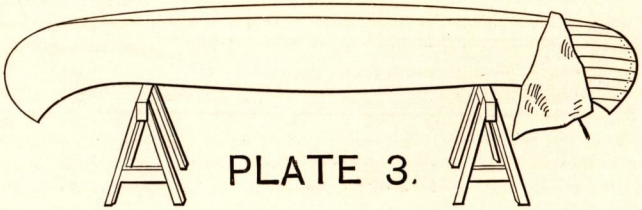


PLATE 3.

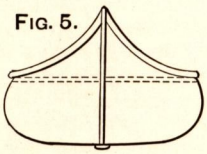


FIG. 5.

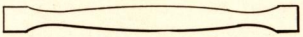
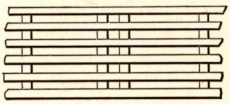


FIG. 6.

FIG. 8.



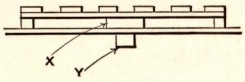
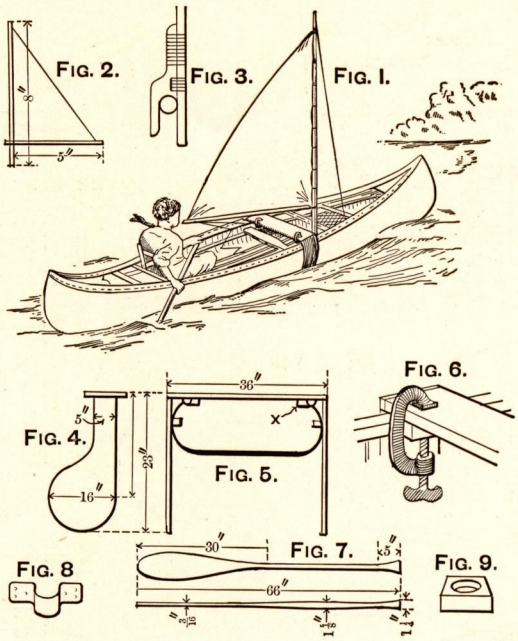


FIG. 7.



II

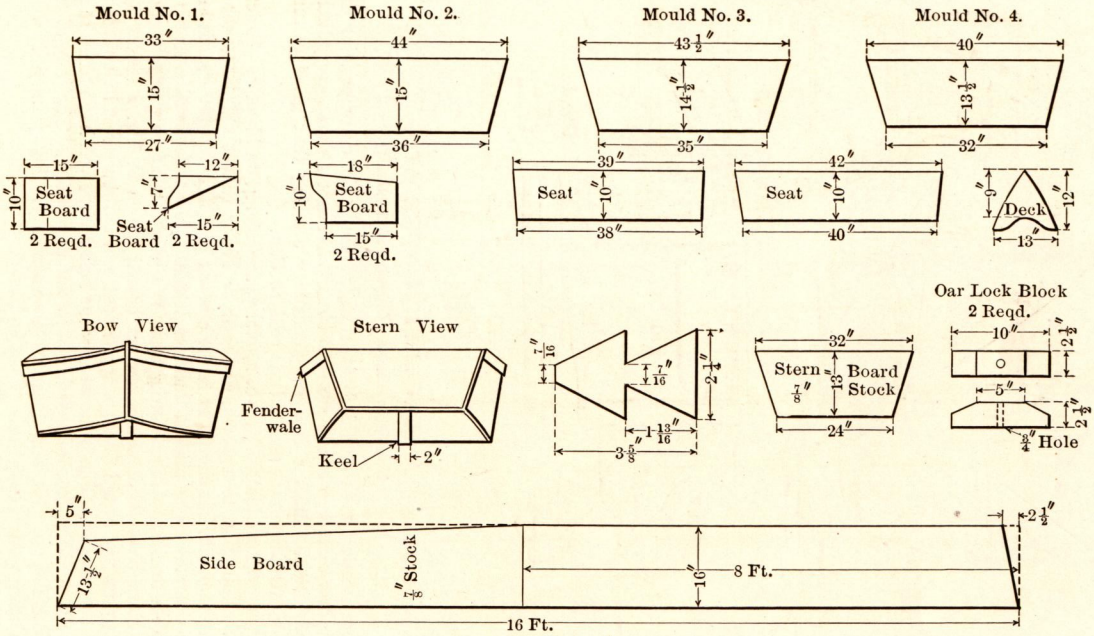
A FLAT-BOTTOM ROWBOAT

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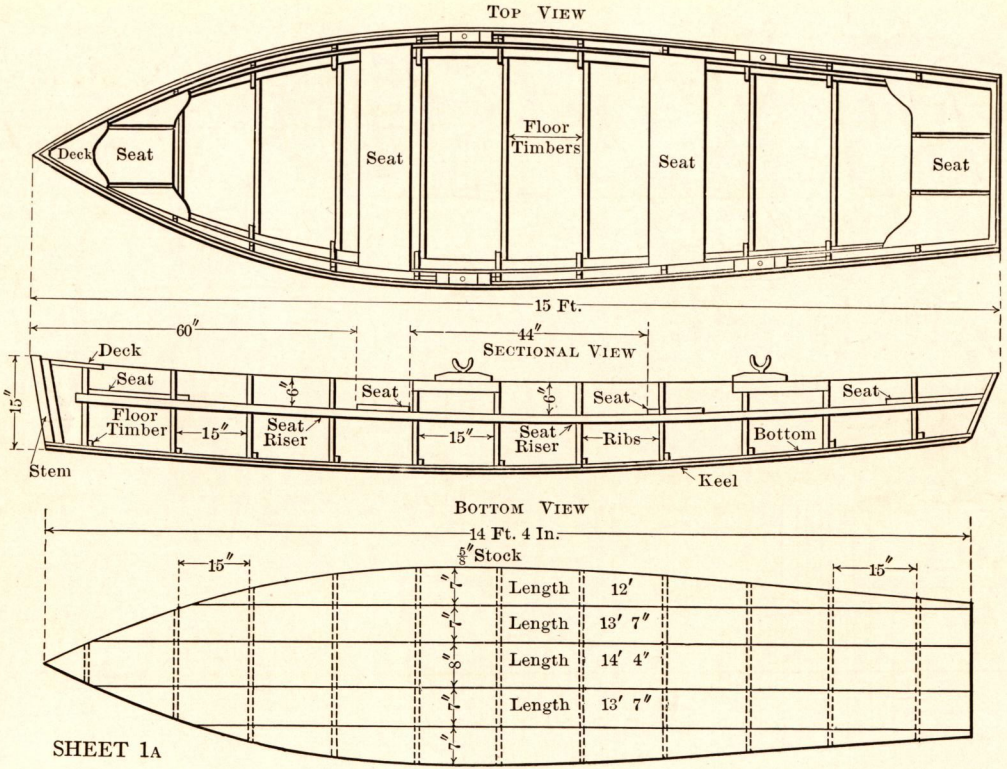
Before starting work on this boat, study carefully the accompanying drawings and see how each step of the job is to be done. Sheet 1 shows every little detail and dimension. Sheet 2 is a supplementary drawing that gives pictures, not plans, of each important stage of the construction.

First saw out molds No. 1, No. 2, No. 3, and No. 4, on Sheet 1. Exact size is shown. Nail them to a plank, as shown in Fig. 1 (Sheet 2). They should not rest on the plank, but should have the amount of space between that is indicated by the clearance notes printed under each one. Now tack the side boards or side streaks on to the molds and bring them to a point at the bow or fore end. Put in the stern board and middle bottom board, shown in Fig. 2 (Sheet 2). The molds are merely to aid in shaping the boat and nothing must be nailed to them except temporarily. Fig. 5 shows how the side boards will have to be shaved off with a plane so the bottom boards will lie flat upon them. The stem of the boat is marked Fig. 3. Its dimensions are shown clearly. Fig. 7 shows how the side boards fit into this stem piece.

Next put in the ribs and floor timber. Figs. 6 and 7 on Sheet 2 show this clearly. The seat riser is a long cleat nailed to the ribs. The floor (Fig. 10) consists of long cleats nailed to the floor timber. Now put on seats and little decking at bow.


Mould No. 1.
33″
15″
27″
15″
10″
Seat Board
2 Reqd.
12″
7″
Seat Board
15″
2 Reqd.
Mould No. 2.
44″
15″
36″
18″
10″
Seat Board
15″
2 Reqd.
Mould No. 3.
43½″
14½″
35″
39″
10″
Seat
38″
42″
10″
Seat
40″
Mould No. 4.
40″
13½″
32″
9″
12″
Deck
13″
Bow View
Stern View
Fender-wale
Keel
2″
7/16″
7/16″
2¼″
1 13/16″
3 5/8″
32″
Stern Board
7/8″
13″
Stock
24″
Oar Lock Block
2 Reqd.
10″
2½″
5″
2½″
¾″ Hole
5″
13½″
Side Board
7/8″ Stock
16″
8 Ft.
2½″
16 Ft.

SHEET 1


TOP VIEW
Deck
Seat
Seat
Floor Timbers
Seat
Seat
15 Ft.
60″
44″
SECTIONAL VIEW
Deck
Seat
Seat
Seat
Seat
15″
6″
6″
Floor Timber
15″
Seat Riser
15″
Seat Riser
Ribs
Bottom
Stem
Keel
BOTTOM VIEW
14 Ft. 4 In.
15″
5/8″ Stock
15″
Length 12′
Length 13′ 7″
Length 14′ 4″
Length 13′ 7″

SHEET 1A

FIG. 1.

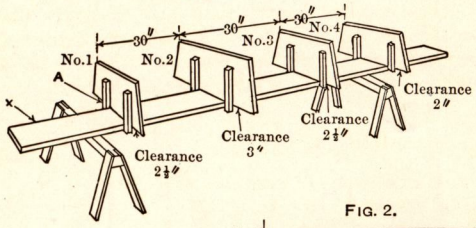


FIG. 9.

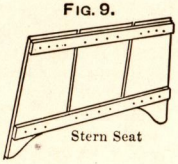


FIG. 2.

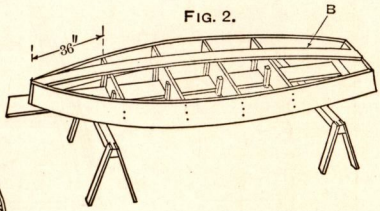


FIG. 3.

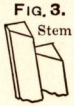


FIG. 6.

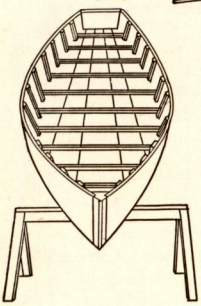


FIG. 12.

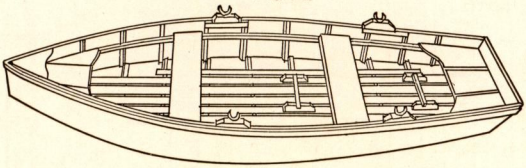


FIG. 5.

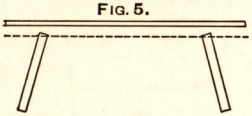


FIG. 8.

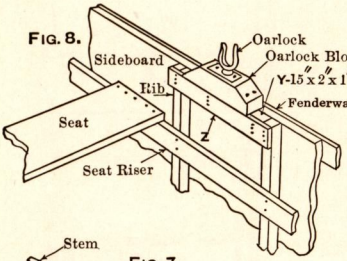


FIG. 10.

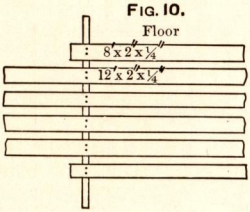


FIG. 7.

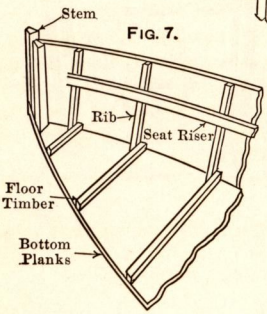


FIG. 11.

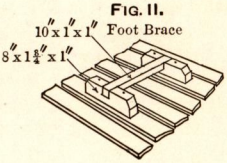
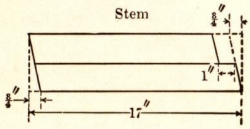


FIG. 4.



SHEET 2

Next come the blocks for oarlocks, shown in Fig. 8 (Sheet 2). Along the whole length of boat at top of the side boards and stern is a strip called the fenderwale. It is shown in the drawing marked "stern view" on Sheet 1. The keel is also shown. It is a hard board, nailed to the bottom of the bottom of the boat.

Bill of Material

Sides.—Two boards 16′ long, 16″ wide, and ⅞″ thick.
Bottom.—One piece, length 14′ 4″, width 8″, thickness ⅝″.
Two pieces, length 13′ 8″, width 7″, thickness ⅝″.
Two pieces, length 12′, width 7″, thickness ⅝″.
Thickness of all bottom boards is the same.
Molds.—(No. 1) one piece, length 33″, width 15″, thickness ⅞″.
(No. 2) one piece, length 44″, width 15″, thickness ⅞″.
(No. 3) one piece, length 43.5″, width 14.5″, thickness ⅞″.
(No. 4) one piece, length 40″, width 13.5″, thickness ⅞″.
Thickness of all molds is the same.
Stern Board.—One piece, length 32″, width 13″, thickness ⅞″.
Seats.—Two pieces, 15″ x 10″ x ⅝″.
Two pieces, 12″ x 7″.
Two pieces, 18″ x 10″.
One piece, 39″ x 10″.
One piece, 42″ x 10″.
All seats are the same thickness.
Deck.—One piece, 13″ x 12″ x ⅞″.
Stem.—One piece, 17″ long x 3⅝″ x 2¼″.
Oarlock Blocks.—Four pieces, 10″ x 2.5″ x 2.5″.
Ribs and Floor Timbers.—42 feet of 1″ square oak strips.
Seat Risers.—Two strips, 14′ long x 2″ wide x ⅞″ thick.
Floor Strips.—Two pieces, 8′ long x 2″ wide x ¼″ or ½″ thick.
Two pieces, 8′ long x 2″ wide x ¼″ or ½″ thick.
Four pieces, 12′ long x 2″ wide x ¼″ or ½″ thick.
Foot Braces.—Four pieces, 8″ long x 1¾″ wide x 1″.
Two pieces, 10″ long x 1″ x 1″. All of oak.
Oarlock Block Supports.—Four pieces, 15″ x 2″ x 1″. *Y* (Fig. 8).
Four pieces, 17″ x 2″ x ⅝″. *Z* (Fig. 8).
Fenderwale.—Two long strips, 16′ long x 2″ wide x ½″ thick.
Keel.—Oak board, 1″ thick, 4″ wide, and 15′ long.

Use 2-inch clout-nails for nailing bottom. Brass screws in all sizes from 1 inch long to 3 inches long will be required. Get 10 cents' worth of each size and fill out with more if the work demands. The boat should receive two coats of paint inside and three coats outside. This will take two gallons of paint and one gallon of boiled oil for thinning purposes. Oarlocks cost 25 cents a pair, two pairs are required. Caulk all cracks in the bottom with oakum.

The mark (′) means feet; the mark (″) means inches; 2.5″ means two and a half inches.

Work very slowly and carefully. Three weeks is good time in which to make this boat right.

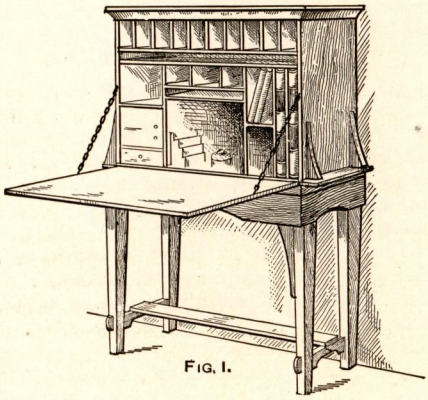
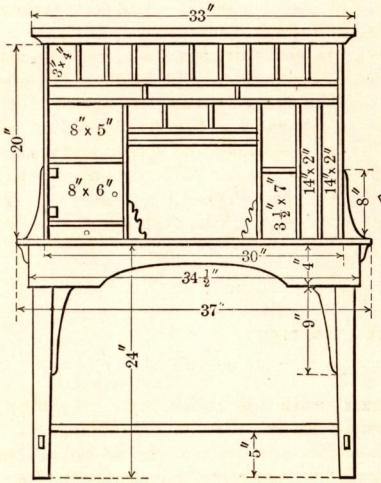


FIG. I.

FIG. 2.



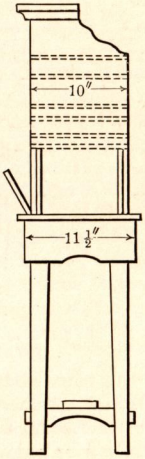
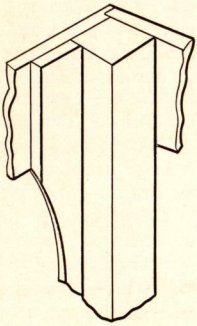


FIG. 3.



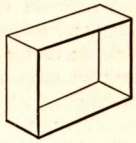


FIG 4.

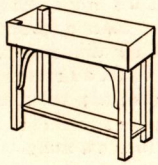


FIG. 5.

III

A DESK

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Fig. 2 shows front and side view of completed desk, every piece and its dimensions being graphically described. First dress down four pieces for legs, 24″ x 2″ x 2″ oak. They are tapered toward the bottom as shown, or may be left straight. At a point 4″ from lower ends join each pair with a brace which goes through a square hole previously chiselled out. On top of braces and 5″ off the ground is the long shelf connecting the leg pairs. Next build frame shown in Fig. 4, and place it in its position as in Fig. 5. Curves may be cut on under side of this frame, or they may be left straight. All the corner joints used so far are clearly shown by Fig. 3. Put a flat board covering on top of framework shown in Fig. 5. Build the upper section of the desk, beginning by setting in place two side uprights, 10″ x 20″ oak. Wedge-shape fancy braces similar to the ones for the upper parts of the legs help to hold the sides firmly to the table-top. The top of desk, 33″ x 12″ oak, is now prepared. The edges must be routed as shown. An amateur must do most of the work with sandpaper. A wood chisel with a curved bit is the tool to use, if possible. The compartments in the upper section are shown and need no further comment.

The front door, which drops down to serve as a writing surface, must be made of several pieces glued together. It must fit accurately in the frame of the upper part, but should not bind or scrape, as it will have a tendency to expand a little. Use brass hinges and strong brass chains to suspend it. When the building work is finished, go over the entire surface with fine sandpaper and rub off all roughness and discolorations. Then brush off all dust, and apply stain according to directions on can. Use it very thin, and put on three coats, if necessary. A wax rubbing will finish it nicely, or varnish can be used. This desk may be made of all pine.

IV

A CURIO CABINET

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Fig. 6 gives a view of all parts in their relation to each other. If yellow or white pine is used, the boards for the sides are 54″ x 12″ x 1″. The piece cut out at the bottom of each side board is 30″ long, 6″ wide at top and 8″ at base. Along rear edge of these long boards is a rabbet to receive the back pieces (Fig. 7). A rabbet is an L-shaped groove cut in the edge of the board. The boards can be rabbeted at the mill, and in this case a half-inch each way will be right. When the sides are thus far cut out, nail the split section together with a cross-piece at bottom. Fig. 4 shows how these cleats are connected with a stretcher. Fig. 2 is the detail of the door corner joint. *X* is the rabbet into which the glass fits. This cut shows the pieces of the door frame separately and after they are joined together. Fig. 3 is an illustration of how the hinges are set in their own depth. When the door is shut, the only part of the hinge to be seen is the round part which contains the pin. The shelves are light half-inch pine pieces which rest on cleats. Fig. 5 shows end of shelf.

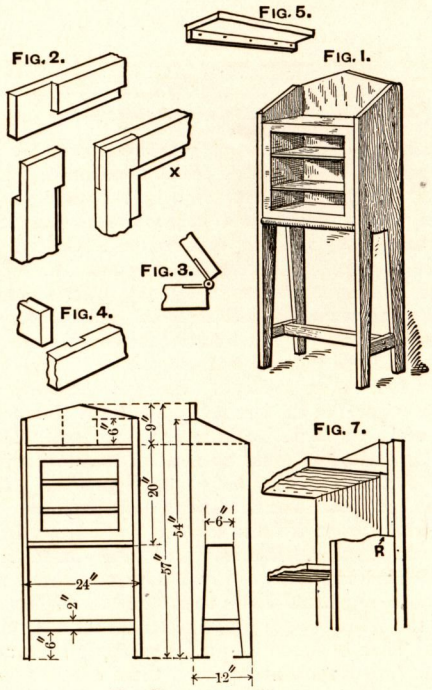


FIG. 6.

If yellow pine is used, to finish the cabinet in natural style apply three coats of varnish, the first and second thinned out and the last full strength. If it is desired stained, put on two coats of stain after the first filler coat of varnish, and after the stain either wax it or varnish it. For open grain wood like oak, use paste filler first, thinning stain and varnish.

V

AN ICE-BOAT

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First get a 2″ x 4″ scantling 14′ long for the backbone of the boat. Place it on edge and taper it fore and aft from a point 4′ from the bow end. The thickness of the ends of the backbone is but 2″ (Fig. 163). To the under edge of the backbone, 5′ from the forward end, a crosspiece is nailed, a 1″ board 6″ wide and 9′ long. Then run braces from ends of crosspiece to forward and rear ends of backbone, and at rear end nail several boards across the braces to serve as a seat. For runners, skates may be used, and three blocks of wood are used for runner shoes. Two of these are cut from a 2″ x 4″ scantling 1′ long; the third block is only 1″ thick. Lay the skates face downward on the blocks with the clamping levers open; then mark the places where clamping jaws touch the wood and drill holes

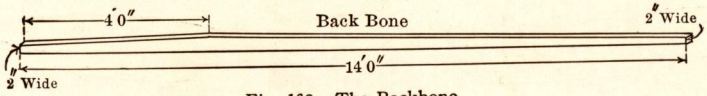


Fig. 163. The Backbone.

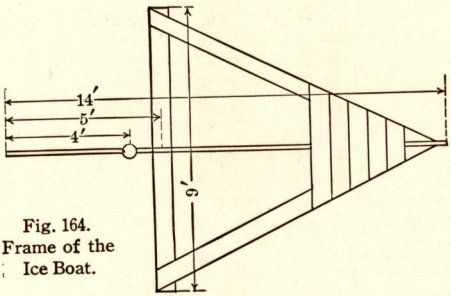


Fig. 164.
Frame of the
Ice Boat.

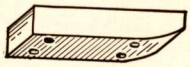


Fig. 165.
Runner Shoe

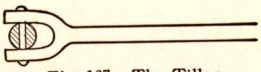


Fig. 167. The Tiller.

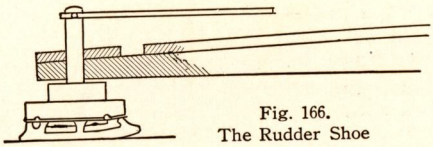


Fig. 166.
The Rudder Shoe

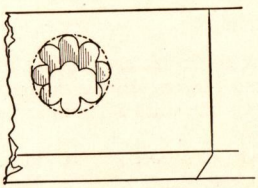


Fig. 168.
Drilling the Mast Step.

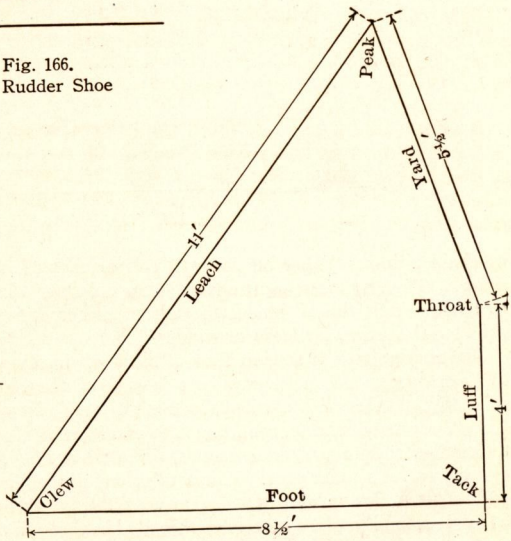


Fig. 169. The Mainsail.

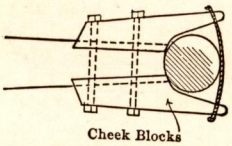


Fig. 170.
Jaws of the Boom.

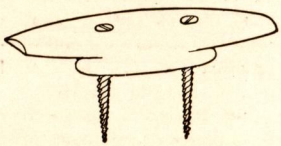


Fig. 171. A Cleat.

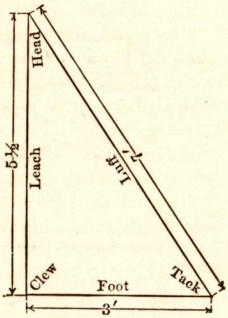


Fig. 172. The Jib-sail.

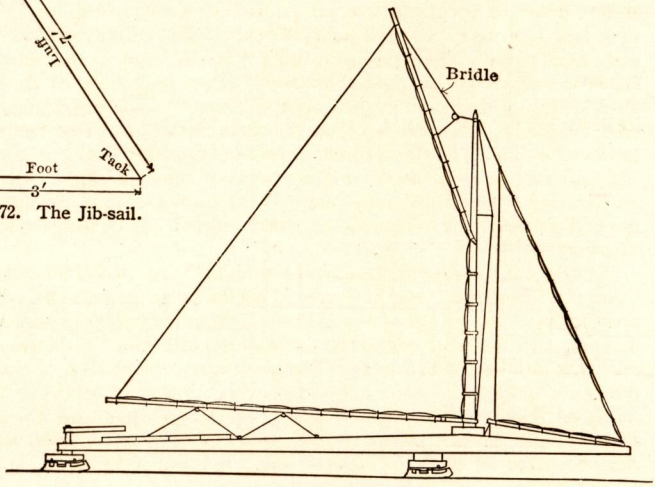


Fig. 173. The Ice Boat Completed.

at these points. Taper off forward end of each block to fit flat against face of skate. Then by inserting the jaws in the holes and closing levers, skate is clamped to block. Bolt the 2″ blocks to ends of the crosspiece; the third block is to be used for the steering runner or rudder.

The rudder post is shaped from a block of hardwood 3″ square and 10″ long. 2″ from lower end make saw cuts in side of the block to depth of ¾″. Next split off the sides with a chisel, forming a large pin with a square shank 8″ long. Cut off corners of shank, rounding it to diameter of 1½″. Fasten the runner block to head of rudder post with screws, and drill a 1½″ hole into backbone at stern end to receive rudder post. Cut a tiller out of a 1″ board to shape shown in Fig. 167. Cut a slot in end of tiller so that the latter fits snugly over top of post, where it is held in place by screws threaded in through the sides.

The mast is a pole 8′ long, tapering from a diameter 2″ at base to 1½″ at top. Cut a step for the mast from a 2″ x 4″ block 8″ long. If no drill large enough to

bore this hole is available, drill eight ½″ holes inside of a 2″ circle (Fig. 168) and cut off the projecting pieces with a chisel. Bolt the mast step firmly to backbone at its thickest part, 4′ from forward end, and brace mast with stay ropes stretched from top to forward end of backbone and ends of the crosspiece. Use a 9′ pole, tapering from 1½″ to 1″ in diameter, for boom of the mainsail; and for gaff a 6′ pole of the same diameter.

Fig. 169 gives dimensions of mainsail. Use curtain rings for mast hoops, attaching five to sail along the luff, and fastening one with a piece of leather to end of gaff. For holding boom to mast, flatten forward end of boom and bolt on two cheek blocks, forming jaws of shape indicated in Fig. 170. Whittle out the jaws to fit nicely around mast, and keep them from slipping off by a piece of rope passed around mast and threaded through ends of cheek blocks. Then get six small pulley blocks, like those used on awnings. String a rope called the throat halyard from throat or forward end of gaff through a pulley block near top of mast and lead it down to backbone, wrapping it around a cleat (Fig. 171). Then run a short length of rope through a pulley block, tying it with some slack to upper end and centre of gaff. This rope is called a "bridle," and to the pulley block on it fasten a rope called the "peak halyard." Pass peak halyard through a pulley block at top of mast and wrap it around a cleat at side of backbone. The rope used for guiding mainsail is called the main sheet. For this fasten two pulley blocks to backbone, one just in front of seat and the other a few feet further forward, and lash two more to boom, midway between these blocks. Then fasten sheet near aft end of backbone and string it through the blocks in the order shown, the free end of sheet being brought back to seat, where it can be fastened to a cleat when necessary.

Next cut out the jib-sail, the size shown in Fig. 172. Lash foot of sail to a jib-boom 3′ 4″ long, attaching jib-boom to backbone at its fore end with two screw eyes, prying open the eye of one of them, linking it through the other, and closing it again; then screwing one of the screw eyes into head of jib-boom and threading the other into end of backbone. Tie upper corner of jib to a jib-halyard passing through a block at top of mast and fastened to a cleat on backbone. Use two sheets on the jib. Attach them to end of jib-boom and pass them on opposite sides of mast through blocks on the crosspiece to stern of boat, where separate cleats are fixed for them. This completes the boat, as shown in Fig. 173.

VI

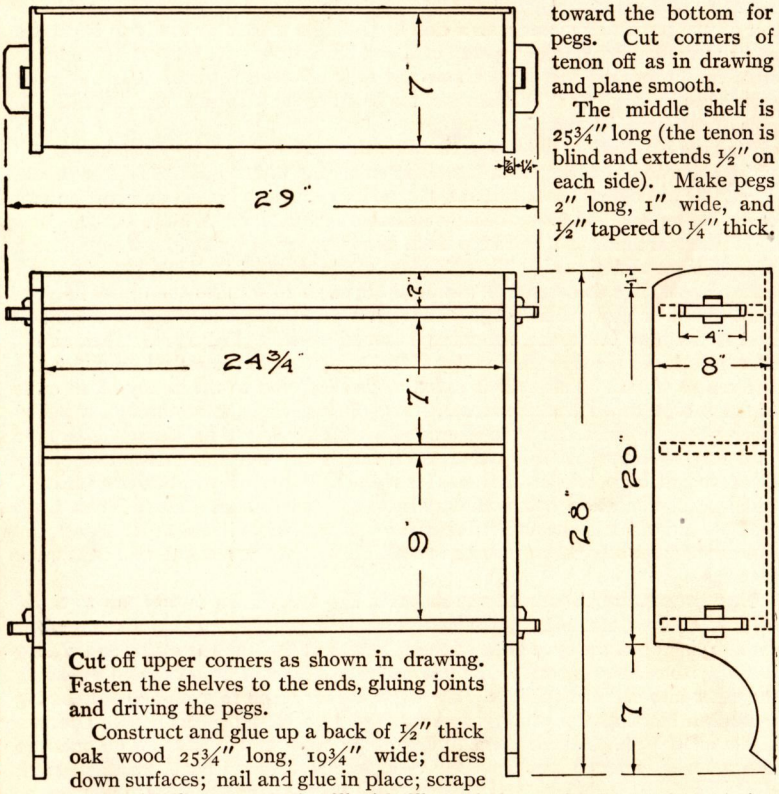
BOOK SHELVES

Design and Description by W. E. Hackett

Plane smooth two boards of oak to 28″ long, 8″ wide, ⅞″ thick; these are for the ends. Square a line across the face of one 7″ from the bottom and another line 1″ from the top; using these lines as guides sketch a design on the board, like the drawing. Cut out on the line with a *turning saw;* lay this end of the book shelves on the other board, draw around it, cut out, place together and smooth edges with a spoke shave and wood file.

Lay out mortises, as in drawing, each mortise to be 4″ long, ⅞″ wide. Cut a rabbet on the inside of these ends ½″ deep and 19″ long (measuring from the top).

Cut out and plane the top and bottom shelf each 29″ long, 7″ wide, ⅞″ thick; cut tenons 2⅛″ long; bore 1″ holes and square with a chisel, tapering a little



toward the bottom for pegs. Cut corners of tenon off as in drawing and plane smooth.

The middle shelf is 25¾″ long (the tenon is blind and extends ½″ on each side). Make pegs 2″ long, 1″ wide, and ½″ tapered to ¼″ thick.

Cut off upper corners as shown in drawing. Fasten the shelves to the ends, gluing joints and driving the pegs.

Construct and glue up a back of ½″ thick oak wood 25¾″ long, 19¾″ wide; dress down surfaces; nail and glue in place; scrape and sandpaper all parts. Stain, fill with filler, rub down with fine sandpaper, give a thin coat of shellac and wax.

VII

SERVING TABLE

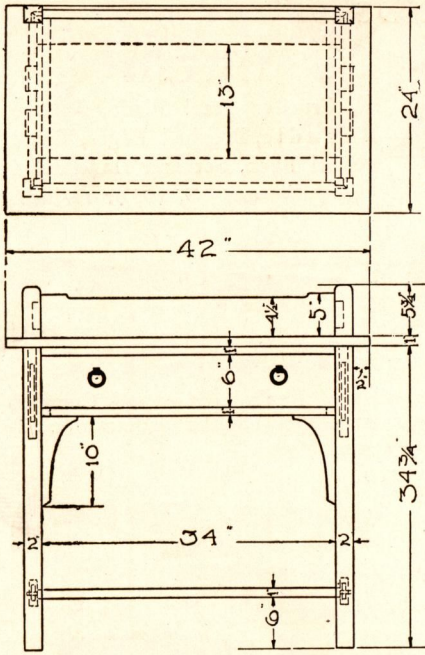
Design and description by W. E. Hackett

The serving table designed here is intended to be constructed out of oak wood.

Cut two legs each 34¾″ long and plane until they are 2″ square. Cut two other legs 41½″ long and plane until they are also 2″ square.

Lay out the mortises for the ends of the table; the first is 5½″ from the bottom and is 2″ long, ⅜″ wide and 1¼″ deep; the second is 26″ from the bottom and is 6⅞″ long, ⅜″ wide, 1¼″ deep.

Lay out the mortises for the front and back pieces; the first back mortise is 28″ from the bottom and is 6″ long, ⅜″ wide, 1¼″ deep; the second one is 36¾″ from the bottom and is 3″ long, ⅜″ wide, 1¼″ deep. The first front mortise is 26½″ from the bottom and is 1″ long, ⅜″ wide, 1¼″ deep; the second front mortise is 33½″ from the bottom and is 1″ x ⅜″ x 1¼″.



Cut side pieces 20″ long. The lower one is 3″ wide and the upper one is 10″ wide; the tenons are 1″ long; find the middle of these bottom pieces, measure 1″ on each side of the middle and lay out and cut mortises for the bottom shelf 3″ long, ⅜″ wide.

After scraping and sanding sides and legs, glue and clamp them together; clean off glue. Cut and plane the bottom shelf 36″ long, 13″ wide, 1″ thick; cut tenons to fit mortises. Cut two pieces for the back each 36″ long, the first piece 8″ wide, the second 5″ wide, the tenons of which are 1″ long. Mark out design on the top piece and cut out with a *turning saw;* smooth with a plane and wood file; scrape and sandpaper until all parts are smooth. Glue and clamp together; clean off glue.

For the front brackets cut a piece of oak 12″ long, 4″ wide, and plane to ⅞″ thickness. Take a piece of paper 10″ long, 4″ wide; sketch design of bracket and cut out; lay on the board, mark one bracket on one end, the other on the other end and saw out with a *turning saw;* smooth with spoke shave and wood file; nail and glue in position. Join and glue up a top 42″ long, 24″ wide, 1″ thick. Dress down surfaces and fit to top of table; secure with cleats and screws on the under side. Scrape and sandpaper.

For the drawer cut a piece of oak 34″ long, 6″ wide, plane to ⅞″ thickness; cut two sides for the drawer 17″ long, 6″ wide, ⅝″ thick; cut a ⅝″ rabbet in the ends of the front for the two sides; ½″ from the bottom edge of the front and sides cut a ⅜″ gain. Glue up a bottom 32½″ long, 17″ wide, ⅜″ thick; dress down the surface and slide in place; glue and nail. Cut a back 32½″ long, 5⅛″ wide, ⅝″ thick, smooth, glue and nail in position. Construct runways for the drawer and screw to sides of ends of table.

Stain table, fill with filler, sandpaper, give a thin coat of shellac, sandpaper again with fine sandpaper and wax. Place iron, brass, or copper handles in position.

SIMONDS SAWS



BACK SAW

Crucible Steel Blade, Apple Handle, Polished Edges, Blued Steel Back, Set and Hand Filed ready for use. 8, 10, or 12 inch.



KEYHOLE SAW



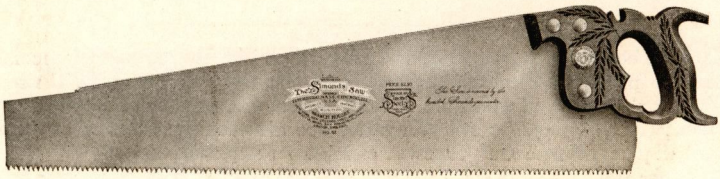
COMPASS SAW

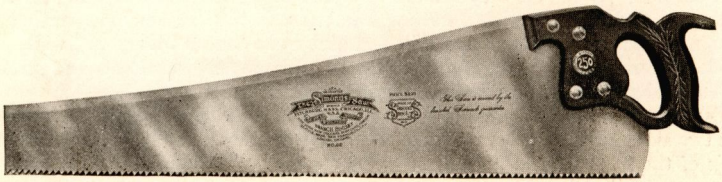
We have a variety of styles and sizes of Keyhole Saws and Compass Saws, some of them with handles arranged so that the blade can be adjusted in any desired position.

NEST OF SAWS

Here, combined with an adjustable handle, we have a 10-inch Keyhole Blade, a 14-inch Compass Blade, and 16-inch Pruning Blade.

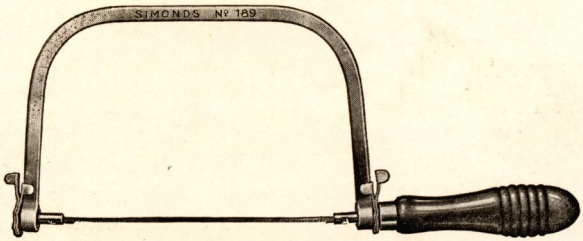






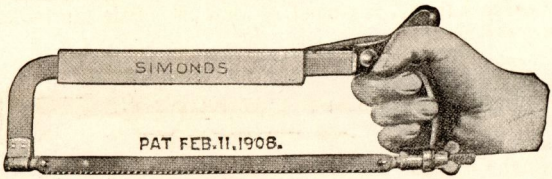
Cross-Cut Hand Saws 7 to 12 points to the inch (for schools we recommend 10 point) and Rip Saws 5 to 7 points to the inch (for schools 7 point). Either shape blade, straight back or skew (sway) back, 20, 22, 24, or 26 inches long. Simonds Saws are made of unexcelled material and every one is covered by an absolute guarantee.

SIMONDS SAWS



COPING SAW

This has been pronounced by Manual Training Instructors as the one satisfactory Coping Saw on the market.



STRAIGHT CUT HACK SAW FRAME

This Simonds Frame allows the hand to grasp the frame in an easy, natural, and comfortable position.



NON-BREAKABLE HACK SAW BLADE

These blades are furnished with either 14, 18, 24, or 32 teeth per inch, according to the cutting to be done.



CABINET OR FLOOR SCRAPER BLADE

TAPER FILE FOR HAND SAWS

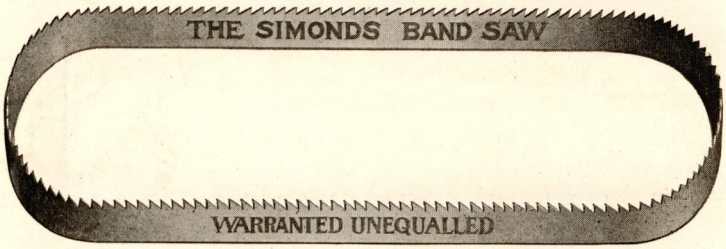


Upon request we will send a Simonds Catalog, giving additional details and prices of any saws or files illustrated in this book, as well as of others which we manufacture but do not illustrate here.

SIMONDS SAWS



Circular Saws are made for either splitting or cutting-off work and of any desired diameter. Full particulars regarding these saws or any others illustrated in this booklet mailed upon application to the Simonds Manufacturing Company, Fitchburg, Mass., U.S.A.

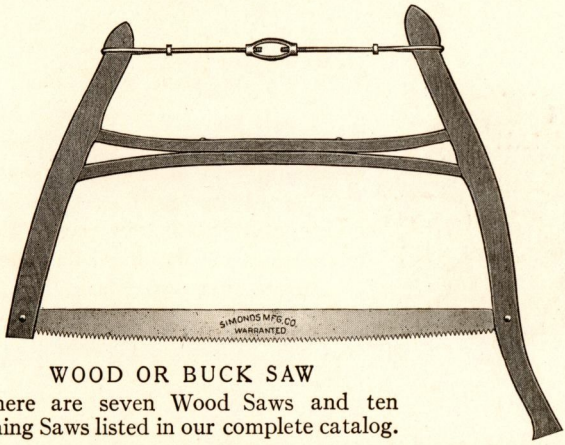


Band Saws are a necessity in every large woodworking shop or sawmill. They are made any standard length and from $\frac{1}{8}$ of an inch up to 20 inches wide.



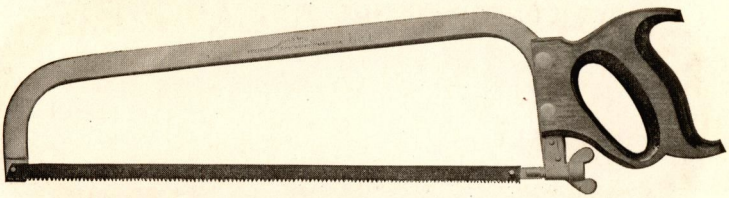
Simonds Crescent Ground Cross-Cut Saw has been the most popular and successful cross-cut saw on the market for the past decade.

SIMONDS SAWS

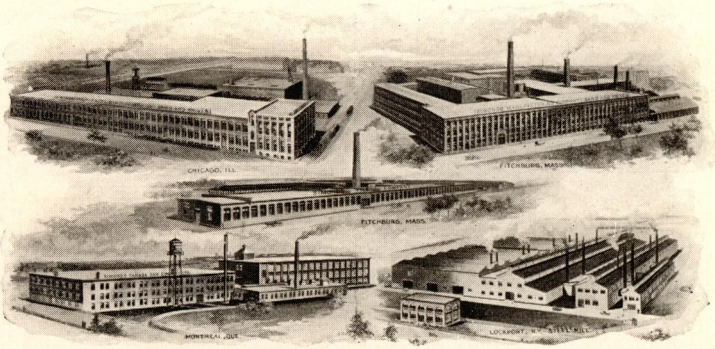


WOOD OR BUCK SAW

There are seven Wood Saws and ten Pruning Saws listed in our complete catalog.



PRUNING SAW



The four factories of the Simonds Manufacturing Company: two at Fitchburg, Mass., one at Chicago, Ill., one at Montreal, Que., and the Simonds Steel Plant at Lockport, N.Y.